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The influence on outcomes of ESL students' performance strategies on a CALL listening comprehension activity

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The influence on outcomes of ESL students' performance strategies on a CALL listening comprehension activity

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Signatures have been redacted for privacy

For Mom and Dad

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ABSTRACT

In light of technological advances, listening activities are increasingly being offered online, and with increasing authenticity in terms of how the tasks reflect activities beyond the classroom setting. Specifically, this study investigates the effectiveness of a CALL listening comprehension activity using an online videotaped academic lecture to promote incidental vocabulary acquisition and listening comprehension. The tasks consist of partial dictation pretest, posttest and delayed posttest, and ten multiple-choice listening comprehension questions respectively.

The academic lecture is also part of an ESL Listening course. Thus, it is important that, firstly, we evaluate the effectiveness of the CALL activity for vocabulary acquisition, and secondly, that we examine what learners actually do during the CALL activity and its influence on the effectiveness of the activity.

The research questions governing this study are: (1) Can a student-controlled authentic listening text that is not modified for the purpose of ESL instruction facilitate language learning? (2) What do learners actually do to complete a CALL activity based on an authentic listening text?

Subjects were 24 students in an ESL Listening course who completed the CALL listening comprehension activity in a controlled environment. Methods include analyzing the partial dictation vocabulary pretest, posttest and delayed posttest, ten multiple-choice listening comprehension questions, nine screen-capture recordings of students' actions, and nine retrospective interviews. Data analysis includes using the phi-coefficient, chi-square,

and ANOVA to learn whether subjects were able to acquire the vocabulary items and to calculate subjects' performance on the multiple-choice listening comprehension test.

Results show that learners were indeed able to acquire incidental vocabulary items and understand the listening text. The study will also discuss what students did to promote this acquisition and comprehension.

CHAPTER 1. INTRODUCTION

Before the advent of the computer, English as a Second Language (ESL) listening skill was taught and acquired through the informal use of the teacher's and students' own speech and via audio-tapes, compact discs, and video tapes. These audio media could be used in or out of class time. However, accessibility was limited to the quantity of the media available and constrained by the cost required to produce and purchase them. Also, the quality of the media deteriorated after repeated use.

Since the incorporation of the computer and Internet into the teaching of listening, many of the disadvantages previously experienced with the audio media have been overcome. Authentic listening passages are available either without cost or relatively cheaply on the Internet and there is no need to produce multiple copies of the same passage for widespread dispersal. Furthermore, as the technology advances, media quality and the varied use of multimedia have improved. Computer technology is also being used for research which informs the teaching of listening mentioned above, particularly through methods of observing student action unobtrusively.

Purpose of the Study

The present study is one such type of research which looks at the incorporation of computer technology into the teaching of listening. Specifically, this study investigates the effectiveness of a Computer-Assisted Language Learning (CALL) listening comprehension activity using an online video of an academic lecture to promote incidental vocabulary acquisition and listening comprehension. The tasks consist of partial dictation vocabulary

pretest, posttest (Hsu, 1994), and delayed posttest, and a multiple-choice listening comprehension test, respectively.

Rationale

This study arose from my two semesters, Fall 2000 and Spring 2001, of teaching English 101L "Academic Listening Strategies", an ESL course, into which all non-native speakers of English who have not passed the listening section of the required English Placement Test of Iowa State University are placed. This course uses a series of online listening tests for homework, which include casual conversational dialogues, more serious discussion issues, and academic lectures. I have chosen to concentrate on one of these academic lectures, one dealing with horticulture, because the academic lecture is very much a part of a university student's life, and appears to be the most difficult and relevant text type for their success. On a broader scale, it is beneficial to research activities and activity types that are actually being used by students.

In light of advances in technology, listening activities are also increasingly being offered online, and with increasing authenticity in terms of how the tasks reflect activities beyond the classroom setting (Bachman & Palmer, 1996, Hegelheimer & Chapelle, 2000). Thus, it is important that, firstly, we evaluate the effectiveness of the CALL activity, and secondly, that we gather accurate information on learners' actual actions (Swain, 1998) and the effect these have on student performance.

Indeed, theory in second language acquisition suggests that learners need to interact with the second language to acquire it. Furthermore, the use of certain learning strategies may prove to be more effective than others in the acquisition of a second language. Thus, the

effectiveness of the CALL activity and information on learners' actions will be examined based on students' interactional modifications and the learning strategies employed.

Research Questions

The literature has had much to say about interactionist theory of second language acquisition, listening comprehension and academic listening, learning strategies, and computer-assisted language learning individually. However, there has been a lack of research that deals with all of the above areas simultaneously, a gap the present study hopes to address. Selected previous research on computer-assisted second language listening comprehension (Hsu, 1994; Brett, 1997) and second language listening strategies (Vandergrift, 1996; 1997) has been instrumental in illuminating the way forward for the present study, thus resulting in the construction of the following research questions:

1. Can a student-controlled authentic listening text that is not modified for the purpose of ESL instruction facilitate language learning?
2. What do learners actually do to complete a CALL activity based on an authentic listening text?

Organization of this Study

The next chapter, Chapter 2, presents a research overview of three areas of relevance to the study, and begins with the listening skill in the interactionist theory of second language acquisition, followed by a look at academic listening, before ending with learning strategies used in listening comprehension. Chapter 3 includes a description of the participants and materials, procedures followed and methods of analysis used. Chapter 4 explains the results of the study, giving the answers to the research questions as revealed by the questionnaire,

tasks and retrospective interview. Chapter 5 gives the summary of results and conclusion to the study. Recommendation and directions for further research will also be included.

CHAPTER 2. LITERATURE REVIEW

This chapter presents a research overview of three areas of relevance to investigating the effectiveness of a CALL multiple-choice listening comprehension activity. The activity in question uses an online video of an academic lecture to promote incidental vocabulary acquisition and listening comprehension. Theory in second language acquisition suggests that language learning is effective when learners are able to interact with the language. Since the language skill under discussion is listening, there is a need to research how incidental vocabulary acquisition and listening comprehension as acquired through listening work within the interactionist theory of second language acquisition. Furthermore, since the listening text type is an academic lecture, it is also necessary to investigate the particular characteristics of academic listening and how these would affect the present study. The audio-visual nature of an online video and its effect on language acquisition also needs to be considered. Added to the mix is the CALL medium through which the activity is conducted, which needs to be investigated as well. Finally, the influence on outcomes of the subjects' use of listening strategies during the CALL activity will also be studied. Indeed, it will be seen that while the many areas mentioned above have had numerous studies conducted when considered in isolation, and there have been a few studies of the different areas conducted in unison, it has been difficult to find studies which considered all the factors mentioned above, a gap which the present study hopes to fill.

The Listening Skill in the Interactionist Theory of Second Language Acquisition

Listening is not only an important skill in its own right but also serves as a springboard towards acquisition in other language skills (Brett, 1997; Dunkel, 1991). The interactionist theory of second language acquisition considers input, which can be obtained through listening, to be of importance and interaction to be central to language acquisition within the confines set by the learner's internal mechanisms (Ellis, 1994b). Thus, it is important to consider how input received via listening and interaction performed by learners affect language acquisition, which is explained in Figure 2.1:

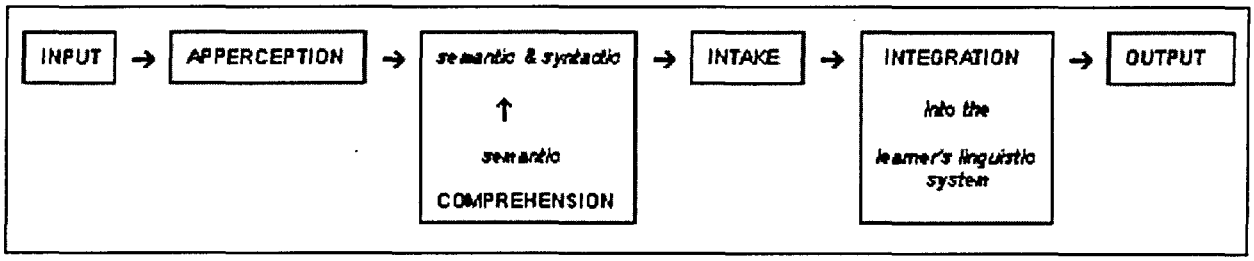


Figure 2.1 Basic components in the SLA process in interactionist research (psycholinguistic perspective) (Chapelle, 1998: 23)

Input, defined as "potentially processable language data which are made available by chance or by design, to the language learner" (Sharwood Smith, 1993: 167), is *apperceived* when learners notice salient input, which they then *comprehend* through semantic and syntactic processing. This results in *intake*, defined as "that portion of the input that learners notice and therefore take into temporary memory" (Ellis, 1994b: 708) which is then *integrated* into learners' linguistic system before it can be produced as *output*. The interactionist portion in the explanation above comes in the form of whatever second language (L2) fact is made salient to the learner through verbal interaction (Ellis, 1994b), in

which the listening skill plays a crucial part. Indeed, it should be noted that much of what has been explained above seems to be unobservable except perhaps for learners' noticing of salient input, the interaction they may perform, and the resulting output. It is thus important, in the context of second language listening, to consider what constitutes noticing input, interaction, and output.

Focus on Form

The "principles for making intake from input through noticing has been introduced as the construct of *focus on form*" [italics in original] (Hegelheimer & Chapelle, 2000: 43) which has been defined as:

> Focus on *form* ... overtly draws students' attention to linguistic elements as they arise incidentally in lessons whose overriding focus is on meaning or communication.
>
> (Long, 1991: 45-46)

> How [the learner's] focal attentional resources are allocated. Although there are degrees of attention, and although attention to form and attention to meaning are not always mutually exclusive, during an otherwise meaning-focused [interaction], focus on form often consists of a shift of attention to linguistic code features – by the teacher and/or one or more students – triggered by perceived problems with comprehension or production.
>
> (Long & Robinson, 1998: 23)

Thus, focus on form is in effect when a student encounters a comprehension problem during a listening activity and examines the linguistic element which is the source of the problem. This examination comes in the form of negotiation of meaning and interactional modifications.

Negotiation of Meaning and Interactional Modifications

In view of learners' exposure to input in the CALL activity, an important concept is *negotiation of meaning*, namely the imperfect comprehension of input and imperfect production of output and the imperfect communication that gave rise to the second language learners' cognizance of this weakness (Long, 1996). Negotiation of meaning is characterized by *interactional modifications* which are divided into discourse management and discourse repair. Discourse management is action taken to simplify discourse to avoid communication problems and to ensure the topic of conversation is understood while discourse repair occurs when communication breakdown has taken place or in response to a learner utterance that contains errors. Specifically, *negotiation of meaning* falls within the discourse repair category and consists of requests for clarification, requests for confirmation, and self- and other-repetitions. Besides the types of interactional modifications mentioned above, other examples include attention-getters and paraphrases (Ellis, 1994b), simplification, elaboration and added redundancy (Larsen-Freeman & Long, 1991). In conjunction with a CALL listening comprehension activity, the point to note is the extent and types of interactional modifications employed by learners and the effect these have on acquisition. For example, it is feasible that certain actions could be interpreted as requests for clarification or requests for confirmation.

Interactionist Theory of Second Language Acquisition in Computer-Assisted Language Learning

Chapelle (1998), in applying the above theory to the development of multimedia CALL, suggests that CALL software can be considered a participant in L2 tasks by viewing it from the "perspective of input provided to learners, output it allows learners to produce,

interactions to engage in and L2 tasks it supports" (p. 26). According to Ellis (1994b), the comprehensible input that results from negotiation of meaning through interactional modifications is of particular benefit because it can facilitate second language acquisition.

Of special interest in the development of the present CALL listening comprehension activity are Chapelle's (1998) suggested criteria given below:

1. Make key linguistic characteristics salient through the repetition of a vocabulary item in the overhead transparency, and the questions and answers in the listening comprehension task.
2. Offer modifications of linguistic input via the instructor's non-verbal cues and reference materials used (for example, picture slides).
3. Provide opportunities for learners to notice their errors whereby learners self-monitor and correct their output before entering answers, which in the case of the present CALL activity, is accomplished through input modification (for example, repetition of the audio-visual text, movement forward and backward within the text, and pausing the text).
4. Provide opportunities for learners to correct their linguistic output through access to more general reference materials like the online dictionary.
5. Support modified interaction between the learner and the computer whereby the interaction moves the learner toward task goals and stops progress along the way to focus on language, which can be accomplished through mouse clicks.

(pp. 27-28)

Thus it can be seen that the interactionist theory of second language acquisition has to be taken into consideration in the implementation of CALL activities and should be a feature in students' utilization of the said activities.

Computer-Assisted Second Language Listening Comprehension Research

More specifically, the interactionist theory mentioned above has been investigated in actual computer-assisted second language listening comprehension research by Hsu (1994),

upon which part of the present study is based, and Brett (1997). Hsu was investigating ESL students' requests of input modification when encountering unknown vocabulary, the types of modification the students perceived as effective, and the relationship between students' requested interactional modifications and firstly, their listening comprehension scores, and secondly, individual words in pre- and post-tests. Her subjects were eleven male and four female ESL students from South Korea, Russia, Saudi Arabia, and Puerto Rico who were enrolled in the beginning listening/speaking Intensive English Orientation Program (IEOP) course at Iowa State University (Hsu, 1994). They were required to complete a partial dictation vocabulary pretest consisting of 16-20 words, multiple-choice listening comprehension posttest, and a questionnaire. The results show that 1) ESL students made input comprehensible via the tools for interactional modification, namely requests for the dictionary, requests for aural repetitions, text reinforcement, written transcriptions, and written definitions for words in aural input, 2) input modification does indeed promote comprehensible input and language acquisition, and 3) the text reinforcement type modification was effective for beginning level ESL students in listening comprehension. (Hsu, 1994).

Elsewhere, Brett (1997) compared "multimedia-delivered listening comprehension tasks with the traditional pedagogic tools of audio cassette or video accompanied by written tasks, ... [and] the language recall abilities of learners who had completed language tasks using these three different media" (p. 42). His subjects were 49 advanced learners of English who were also final year undergraduates from France, Germany and Spain on a business and languages degree at the University of Wolverhampton. They were required to listen to six different video-based listening texts each between 1.5-2 minutes in length and complete

true/false statements or a rearrangement exercise as while-listening, that is, main activities, and cloze passages with deletions made at key points in the texts as language recall tasks. They were also required to complete a 5-point Likert scale questionnaire "to explain any different results in learner success rates with the three different media" (Brett, 1997: 43). Results showed that there were "higher success rates for tasks completed on multimedia" (Brett, 1997: 50). This may be caused by "gains in efficiency of the use of a computer interface for all of the components of listening tasks, ... [and instant feedback for] responses to all the parts of the tasks" (Brett, 1997: 49).

While Hsu was also looking at modified input and how it affected listening comprehension, the facilities for input modification, namely repetition, text reinforcement and dictionary, were already built into the resources, i.e. CD-ROM, she was using. It will be interesting to discover what students do to modify input when facilities beyond repetition for input modification is not part of the software. This is because complex software resources like those Hsu was using require expertise beyond most ESL teachers' capabilities while relatively simpler input modification resources like repetition might be within the programming or webpage making ability of these ESL teachers. Furthermore, there are rich resources online available for the enterprising student which can augment the existing resources and whether learners actually use them should be investigated.

Brett, on the other hand, was looking at video-based, multimedia-delivered listening texts which have been produced for ESL instruction. However, in an era where authentic listening materials which have not been produced for ESL instruction are readily and cheaply available (Joiner, 1997), it would be beneficial to investigate their usefulness for ESL instruction in view of the call for ESL materials and activities to reflect those found outside

the classroom setting (Bachman & Palmer, 1996), which had previously been difficult to implement because of the exorbitant price of said materials. Even though Bachman et. al's call was not directed towards users of the online environment, its claim is equally applicable to CALL activities.

Furthermore, in terms of subjects, Hsu was looking at beginner learners while Brett was investigating advanced learners. It would therefore also be useful to consider subjects of all three proficiency levels, namely beginners, intermediate and advanced learners, completing the same CALL activity.

Thus, there are questions that still remain unanswered, such as the types of input modification employed by students according to proficiency level and their effects on performance, and the effect of instant feedback on input modification and performance. Because of the accelerating advances in technology, resources are available today that are able to shed more light on these questions. These resources include screen-capturing software and programming software capable of keeping track of students' actions.

Incidental Vocabulary Acquisition

Incidental acquisition forms one-half of an equation with intentional acquisition and has been variously identified with acquisition (Krashen, 1981) and implicit learning (Ellis, 1990). Incidental vocabulary acquisition itself can be defined as "learning without an intent to learn, or as the learning of one thing, e.g. vocabulary, when the learner's primary objective is to do something else" (Laufer & Hulstijn, 2001: 10). In the case of the present study, the primary objective was to complete ten multiple-choice listening comprehension questions. While some research has suggested that intentional learning results in better vocabulary acquisition (Pressley, Levin, & McDaniel, 1987; Hulstijn, 1992), it has been agreed that most

vocabulary is acquired incidentally (Ellis, 1994a; Sternberg, 1987). Furthermore, the concept of vocabulary acquisition itself exists in a continuum, as evidenced by the terms breadth vs. depth (Curtis, 1987), potential vs. real (Palmberg, 1987), and receptive vs. productive (Ellis, 1994a).

Ellis (1994a) has explained at length the factors affecting incidental vocabulary acquisition, which can be listed as follows:

1. Intrinsic word properties: Part of speech, distinctiveness of word form, length of word form, degree of correlation between form and meaning, imageablity.
2. Learner factors: Background knowledge, procedural knowledge, immediate phonological memory, the learner's first language (L1).
3. Input factors: Frequency, saliency through focus, availability of contextual cues, input complexity.
4. Interactional factors

Under intrinsic word properties, it has been found that the parts of speech which are progressively more difficult to learn are nouns, adjectives, verbs and adverbs. Distinctiveness of word form works for ease of learning while length of word form works against it. Meanwhile, the more the sound of a word correlates with its meaning, the easier it is to learn the word because learners initially store words according to their sounds. Finally, imageability refers to the ability of a word to produce a mental image, hence the possibility of learning a concrete word before an abstract one.

Within the learner factors category, there is a close relationship between vocabulary acquisition and world knowledge, and metacognitive and metalinguistic knowledge. Furthermore, similarity between a student's L1 and L2 will ease vocabulary learning.

However, the place of incidental vocabulary acquisition in the interactionist theory of second language acquisition is particularly obvious in the input and interactional factors above. The question that arises is whether the relationship between frequency and vocabulary acquisition is a monotonic one whereby acquisition increases with the number of exposure, or whether there is a threshold effect at work, that is, a set minimum number of exposures has to be achieved before a vocabulary item would be acquired (Ellis, 1994a). Research appears to favor the threshold option (Hulstijn, 1992; Palmberg, 1987; Nagy, Anderson & Herman, 1987). In the present study, frequency is achieved through audio and/or written repetition, and of course, frequency is also one way to make a vocabulary item salient. Vocabulary can also be acquired incidentally via the interactional modifications covered earlier.

Research on incidental vocabulary acquisition has furnished some general conclusions. The superior tasks have the following characteristics:

- a deeper level of processing of the new words
- greater depth of processing
- more intense quality of information processing
- degree of elaboration
- quality of attention
- richness of encoding

(Ellis, 1994a: 12)

This research is shown in Table 2.1.

Table 2.1 Task effect on incidental vocabulary learning

The more effective task	*The less effective task*	*Reference*
Meaning selected from several options	Meaning explained by synonym	Hulstijn, 1992
Meaning looked up in a dictionary	Reading with/without guessing	Knight, 1994; Luppescu & Day, 1993
Meaning looked up in a dictionary	Meaning provided in a marginal gloss	Hulstijn *et al.*, 1996
Reading and a series of vocabulary exercises	Reading only (and inferring meaning)	Paribakht & Wesche, 1997
Meaning negotiated	Meaning not negotiated	Newton, 1995
Negotiated input	Premodified input	R. Ellis *et al.*, 1994
Used in original sentences (oral task)	Used in non-original sentences	Joe, 1995; Joe, 1998
Interactionally modified output	Interactionally modified input	R. Ellis & He, 1999
Used in a composition (L1-L2 look-up)	Encountered in a reading task (L1-L2 look-up)	Hulstijn & Trompetter, 1998
Reading, words looked up in a dictionary (self-imposed)	Reading only, words not looked up	Cho & Krashen, 1994

(Laufer & Hulstijn, 2001: 13)

It should be noted, however, that the research mentioned in Table 2.1 focuses primarily on the reading skill. It is important, therefore, to investigate if and to what extent vocabulary acquired incidentally through listening is similar to that acquired through reading.

The interactionist theory of second language acquisition presents a general overview of the theoretical perspective of the listening skill within second language acquisition. However, a more specific treatment of the listening skill as it pertains to the present study is necessary, which brings us to the next section, academic listening.

Academic Listening

Academic listening has many unique characteristics which has to be taken into consideration when teaching students to listen in a university setting. Examples include its primarily non-interactional nature, the need for skill in handling specialist vocabulary and

long stretches of speech (Flowerdew, 1994), the sub-skills required to decode an academic lecture (Higgins, 1995) the audio-visual aspect of academic listening, and the place of authentic listening texts and activities in the teaching of academic listening.

However, academic listening does share some characteristics with the listening skill in general, which can be defined as "the process of receiving an acoustic signal, which is then structured" (Bejar, Douglas, Jamieson, Nissan, & Turner, 2000: 2), with the process of listening comprehension occurring in the structuring stage. Bejar *et. al* (2000) further state that "listening comprehension consists of a *listening* stage and a *response* stage" [italics in original] (p. 2). In the listening stage, the acoustic signal is received and processed through specialized receptive and cognitive processes, with access in real-time to three types of knowledge, namely situational knowledge, linguistic knowledge, and background knowledge. With academic listening, however, the density of information presented would place a heavier load on the cognitive processes, requiring greater dependence on situational, linguistic and background knowledge. Furthermore, it should be noted that the receptive and cognitive processes and the knowledge accessed are constrained by working memory capacity, which is where note-taking ability comes into play. The outcome of the processed acoustic signal is a propositional representation of input, which are operated on to produce a response that can come in the form of a selection of multiple choices, a written response or a spoken response. In the case of the present study, the outcomes are a selection of multiple-choice answers and a limited written response.

Types of Listening Activities

In terms of the types of listening activities that can be conducted in the computer medium, Pennington (1989) states that there are five task-types for oral language development, as illustrated in Table 2.2:

Table 2.2 Relationship between five task-types in an oral language curriculum

	Involves Spoken Interaction	Degree of External Control of Activity
1. Free Conversation	yes	none
2. Directed Discussion	yes	little
3. Situational Simulation	yes	moderate
4. Highly Structured Conversation-Based Activities	maybe	great
5. Non-Interactional Speech-Based Activities	no	great

The first four task-types can be based on two-way conversational interaction but the fifth task-type cannot, and it is this fifth task-type that we are interested in, activities such as:

> choral or individual repetition, monologues or lectures given as speeches and recorded on tape ... or used as stimuli for listening exercises (e.g., cloze passages or various types of listening comprehension exercises), ... the category for all listening or speaking activities designed to assist students in producing and comprehending material which is not based on spoken interaction between two participants.
>
> (Pennington, 1989: 102)

Thus, one of the non-interactional speech-based activities mentioned above is the lecture. The academic lecture is explained in the following section.

Academic Lecture

Indeed, while "listening is used far more than any other single language skill in normal daily life" (Morley, 2001: 69), in the life of a university student, this listening takes the form of the lecture, thus making academic listening skills an "essential component of

communicative competence in a university setting" (Flowerdew, 1994: 7). The unique features of listening to lectures include the need for specialist background knowledge, the ability to distinguish between relevant and non-relevant material, to handle long stretches of speech, to take notes, and to integrate the message with information received in other ways (Flowerdew, 1994). These skills are crucial for non-native speakers, for whom sound system problems appear to present particular challenges (Brown, 1990). Kelly (1991) has further argued that vocabulary problems are a significant barrier to listening comprehension for advanced learners. In view of this, the use of online videotaped academic lectures might present a viable solution. Its ability to vary input enables non-native speakers to comprehend the lecture more successfully (Flowerdew, 1994). Also, this same advantage presents opportunities for research into the possibility of incidental vocabulary acquisition.

Thus, having defined the type of interaction involved, it is important to recognize the demands that the material would place on learners. Higgins (1995) argues that the sub-skills required to decode an academic lecture include:

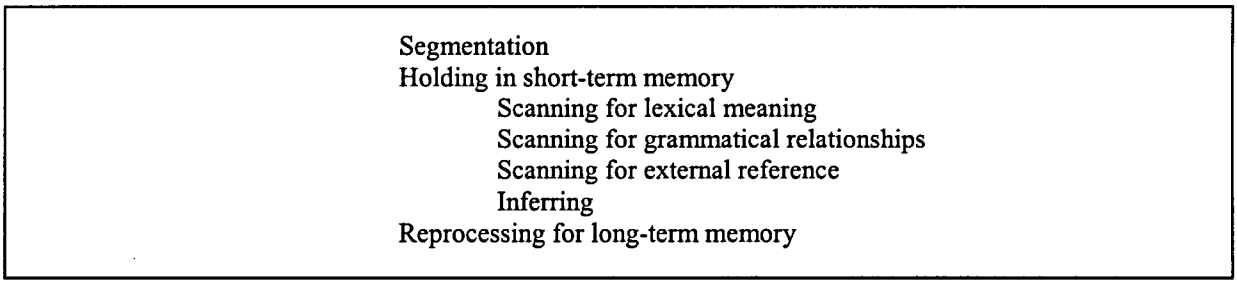


Figure 2.2 Sub-skills required to decode an academic lecture (Higgins, 1995: 119)

Besides processing at the segmentation level, that is, "recognition of the boundaries of meaning units" (Higgins, 1995: 119), listening to an academic lecture also requires

reprocessing for long-term memory what is held in the short-term memory via scanning for lexical meaning, grammatical relationships, external reference, and inferring. Within the context of the present study, this would mean identifying the meanings of unfamiliar and specialist vocabulary items, studying the grammatical relationships between words to arrive at an accurate interpretation of meaning, and accessing external knowledge, especially in the field of horticulture. In other words, the demands placed on listening to an academic lecture may be higher than on other listening task-types, as introduced earlier by Pennington (1989).

The Video Aspect in Academic Listening

In view of the fact that academic listening may be more demanding than other types of listening, it seems beneficial to present the academic lecture in the video format. Indeed, many researchers have acknowledged that the visual aspect of the academic lecture supports or complements listening comprehension (Thompson, 1995; Rubin, 1990; Mueller, 1980; Wolff, 1987; Herron, 1994) while others would maintain that the visual modality is integral to listening comprehension (Kellerman, 1990).

Many reasons have been given for the above argument, which includes the benefit provided by the presence of paralinguistic features, namely kinesics, proxemics, and prosody. Kinesics refers to body language, that is, movements of the hands, face, and body (Hoven, 1999). Proxemics refers to acceptable and culturally appropriate physical distance between interlocutors (Hurley, 1992) while prosody includes accent, intonation and rhythm (Hoven, 1999). These features become even more important in the context of second language listening where the audio information may be "hard to hear" for technical reasons or "hard to understand" because of the second language listener's lack of facility with the language (Kellerman, 1990: 277). Indeed, while the use of authentic listening texts has been much

advocated in the literature, one must not forget that authenticity also includes mode of presentation, which includes the visual aspect in the case of the academic lecture (Kellerman, 1990).

With regards to the possibility of vocabulary acquisition in a video supported environment, Duquette and Renié (1998) found that many exposures of a vocabulary item in various contexts - "animated images, still and pedagogical images, images supported by text" (p. 24) - encourage acquisition.

However, it should be pointed out that while present research has dealt extensively with the positive impact of the visual modality in academic listening, there has been little research which has explored the effect of the different media used in the video format, for example, the 'talking head', overhead transparency notes, and picture slides. It is the intent of the present study to investigate these media and the effect they have on incidental vocabulary acquisition and listening comprehension.

Authentic Listening Texts and Activities

In considering the listening skill, the academic lecture and the viability of the video format, an important concept related to these is authenticity. Porter and Roberts (1981) define authenticity as "'the real thing' - instances of spoken language which were not initiated for the purpose of teaching" (p. 37). In the present study, the academic lecture is authentic in that it is presented by an expert in the field to a class of students and recorded in the form it is presented, that is, in audio-visual format. Besides authenticity of text and mode of presentation, there also exists authenticity of task, that is, the activity should reflect language activities which the subjects would encounter outside the classroom (Bachman & Palmer, 1996).

Closely related to the concept of authenticity is motivation. It is believed that the CALL activity would prove motivating because of the authentic nature of the text. Students would be listening to a lot of academic lectures throughout their academic career. Also, the online nature of both the listening text and multiple-choice listening comprehension task might be a motivating factor, especially since learners received immediate feedback on their test results.

The two research areas of the interactionist theory of second language acquisition and academic listening give a broad picture of the theoretical perspectives of listening comprehension and incidental vocabulary acquisition. However, a more detailed examination of what actually occurs during the CALL activity, that is, the listening strategies employed, would provide a more complete picture to the study.

Learning Strategies used in Listening Comprehension

Studying learning strategies is problematic, not least of which involves defining them. Ellis (1994b), after considering the problems inherent in defining learning strategies, has given the following main characteristics of strategies:

1. Strategies refer to both general approaches and specific actions or techniques used to learn an L2.
2. Strategies are problem-orientated – the learner deploys a strategy to overcome some particular learning problem.
3. Learners are generally aware of the strategies they use and can identify what they consist of if they are asked to pay attention to what they are doing/thinking.
4. Strategies involve linguistic behavior ... and non-linguistic ...
5. Linguistic strategies can be performed in the L1 and in the L2.

6. Some strategies are behavioral while others are mental. Thus some strategies are directly observable, while others are not.

7. In the main, strategies contribute directly to learning by providing learners with data about the L2 which they can then process. However, some strategies may also contribute indirectly ...

8. Strategy use varies considerably as a result of both the kind of task the learner is engaged in and individual learner preferences.

(Ellis, 1994b: 532-533)

In addition, *language* learning strategies can be defined as "deliberate, cognitive steps used by learners to enhance comprehension, learning and retention of the target language; they can be accessed for conscious verbal report" (Vandergrift, 1996: 202, adapted from Rigney, 1978 and O'Malley & Chamot, 1990).

Types of Listening Strategies

In terms of the types of strategies, O'Malley and Chamot (1990) have distinguished three major types, namely:

> *Cognitive strategies* refer to 'the steps or operations used in problem-solving that require direct analysis, transformation or synthesis of learning materials' (Rubin, 1987). ... *Metacognitive strategies* make use of knowledge about cognitive processes and constitute an attempt to regulate language learning by means of planning, monitoring, and evaluating. ... *Social/affective strategies* concern the ways in which learners elect to interact with other learners and native speakers [italics in original].
>
> (Ellis, 1994: 536-538)

Based on O'Malley and Chamot (1990) and Oxford's (1990) frameworks, Vandergrift (1996; 1997) has come up with a framework of Listening Comprehension Strategies as illustrated below:

Table 2.3 Framework of listening comprehension strategies

Metacognitive strategies	Cognitive strategies	Socio-affective strategies
1. Planning	1. Inferencing	1. Questioning for clarification *
a) Advance organization *	a) Linguistic inferencing *	2. Cooperation
b) Directed attention *	b) Voice and paralinguistic inferencing	3. Lowering anxiety
c) Selective attention *	c) Kinesic inferencing	4. Self-encouragement *
d) Self-management *	d) Extralinguistic inferencing *	5. Taking emotional temperature
2. Monitoring	e) Between parts inferencing *	
a) Comprehension monitoring *	2. Elaboration	
b) Auditory monitoring	a) Personal elaboration	
c) Double-check monitoring *	b) World elaboration	
3. Evaluating	c) Academic elaboration *	
a) Performance evaluation *	d) Questioning elaboration	
b) Strategy evaluation	e) Creative elaboration	
4. Problem identification	f) Imagery	
	3. Summarization *	
	4. Translation	
	5. Transfer	
	6. Repetition	
	7. Resourcing *	
	8. Grouping *	
	9. Note taking	
	10. Deduction/induction	
	11. Substitution	

Note: * Listening comprehension strategies found in the present study

(Vandergrift, 1996; 1997, based on O'Malley and Chamot (1990) and Oxford's (1990) frameworks)

As Table 2.3 shows, there appears to be more types of cognitive strategies than metacognitive and socio-affective strategies. However, based on the present study, metacognitive strategies seem to be more popular than cognitive and socio-affective strategies. In order to know how the practice of listening strategies in the present study compares with previous research, some listening strategy research is given in the following section.

Listening Comprehension Strategy Research

Indeed, it should be noted that while Vandergrift took much of his framework from previous learning strategy studies, his appears to be the only listening comprehension strategies framework obtainable, which will be instrumental in analyzing the listening strategies employed by the subjects within the context of a CALL activity. The complete list, definitions and examples of the listening strategies can be found in Appendix A.

Part of the present study is concerned with the listening comprehension strategies employed by advanced, intermediate and beginner subjects. Thus, researching the types of listening comprehension strategies used in other studies would prove valuable. In investigating strategies used by high school students learning French in the core program and the variance of strategy choices according to course level, Vandergrift (1996) found that cognitive strategies are most prominent and that within metacognitive strategies, participants are most familiar with planning strategies. Research literature on listening comprehension strategies also state that "metacognitive strategies such as selective attention and comprehension monitoring, as well as cognitive strategies such as elaboration and inferencing, are reported more frequently and in more effective combinations by successful listeners" (Vandergrift, 1997: 389). Following his research of the year before, Vandergrift

expanded on the scope of his research and found that cognitive strategies are reported most often, namely summarization, elaboration, inferencing, translation, transfer and repetition, followed by metacognitive strategies, namely planning strategies. He also discovered that the reporting of metacognitive strategies increased with the increase in course level. It should be noted however that the subject pool used by Vandergrift was very specific - high school students learning French. It is the intent of the present study to discover if the strategies used by tertiary level ESL students are similar to those described above. A detailed summary of Vandergrift's (1996; 1997) two studies is found in Appendix B.

Furthermore, strategy choice can be affected by individual learner differences which include:

1. Beliefs about language learning: formal versus functional practice, emphasis on learning versus using the language.
2. Learner factors: e.g. age, aptitude, learning style, motivation, learners' goals, and personality types.
3. Learner's personal background: whereby the more experienced language learners have an advantage over the less experienced language learners.
4. Situational and social factors: e.g. language being learned, learning setting, type of learning tasks and sex.

(Ellis, 1994b)

Other factors include achievement, level of language learning, method of teaching, and cultural background of the learner (Politzer & McGroarty, 1985).

Discussion of the listening strategies employed by the subjects in the present study is presented in *Chapter 4*, pages 59-69.

Strategy Instruction

Arising from research on listening comprehension strategies is the idea that students can be instructed in strategy use to enhance their performance on listening tasks (Vandergrift, 1999). In research conducted by O'Malley and Chamot (1990), intermediate-level high school ESL learners were divided into three groups: the treatment group receiving instruction in a metacognitive, a cognitive and a socio-affective strategy for academic listening, the cognitive group receiving instruction in a cognitive and a socio-affective strategy, and the control group receiving no strategy instruction. The treatment group outperformed the control and cognitive groups on three of four post-listening tests. In another study (Thompson & Rubin, 1996), a group of university students learning Russian were divided into two groups. The first group receiving metacognitive and cognitive strategy instruction in listening to video-recorded texts outperformed the control group who had received no instruction. Thus, the data obtained from strategy research, including that of the present study, should provide information valuable for the implementation of strategy instruction. This is especially true of the relatively new area of CALL listening comprehension strategy instruction.

Conclusion

This chapter gives background information about the issues involved in the present study whereby different aspects of the study draw on knowledge from the fields of input and interaction, academic listening, and learning strategies. However, the one common theme which subsumes all the different aspects and fields is the need that we "test what learners *actually do*, not what the research assumes instructions and task demands will lead learners to focus on" [italics in original] (Swain, 1998: 80).

CHAPTER 3. METHODOLOGY

This chapter describes the process followed in collecting the data used in this study and is divided into: 1) participants – the subjects and audience of the learning task; 2) materials – the questionnaire, academic lecture, tasks, and hardware and software configurations and the changes implemented as a result of the pilot study; 3) procedures – the design and implementation of the materials in question; and 4) method of analysis – used to address the research questions.

Participants

The subjects were 24 English 101L students (for explanation, refer to *Chapter 1*, page 2). 96% of them fell within the 18-32 age range, with the remaining one person (4%) falling within the >42 age range. The subjects were also predominantly male (79%). Furthermore, since more than two-thirds (70%) of them came from China, Indonesia and Korea, it is reasonable to expect that the Chinese, Indonesian and Korean languages would make up most (78%) of the subjects' native languages. In terms of English Language proficiency, if the subjects were to be divided into three proficiency levels based on their TOEFL scores, nearly half of them (42%) would fall into the low proficiency (501-530) group, while another 41% would belong to the high proficiency (>560) group, with a relatively smaller group (17%) making up the intermediate proficiency (531-560) group. The subjects were also evenly divided between undergraduates and graduates with the bulk of the undergraduates (29%) being freshmen. At the graduate level, there were more students pursuing their PhDs than those pursuing their Masters.

However, there were another six subjects who were excluded from the 24 subjects shown above because they had neglected to take the partial dictation posttest and/or delayed posttest, and the CALL activity. More complete information about the subjects is available in Appendix C.

Pilot Study

Before elaborating on the different parts of the learning task, a look at the pilot study and the modifications that arose from it would be useful. The learning task consisted of the questionnaire, partial dictation tests, and academic lecture. The original partial dictation tests consisted of only the pretest and posttest, the purpose of which was to discover if students were able to acquire vocabulary incidentally. However, the delayed posttest was later added to find out if students could retain the said vocabulary. For the academic lecture, it was suggested that an online dictionary be added to the CALL activity website to give students the opportunity to check unknown words if they so desired. Furthermore, students' performance on the ten multiple-choice listening comprehension questions were analyzed and questions which were answered correctly or incorrectly by all the students were discarded. Also, a Table of Specifications was constructed, as detailed later in the chapter. An entirely new section was added after the pilot study, namely that of retrospective interviews with nine students (three advanced, intermediate, and beginner learners respectively) to investigate their listening strategies. Technical difficulties encountered during the pilot study showed the researcher where the problem areas were and what would need to be ironed out before the actual data collection, chief of which were the necessity of

having enough RAM to accommodate the screen-capturing software used (Camtasia Recorder) and the inability of the software to capture the video of the academic lecture.

Materials

The materials, which sought to investigate incidental vocabulary acquisition and listening comprehension through a self-paced, autonomous learning mode, consisted of three parts:

1. A questionnaire;
2. Partial dictation pretest, posttest, and delayed posttest (in the form of a narrative) of twenty of the most difficult vocabulary items, conducted before and after listening to the academic lecture;
3. The CALL activity - a 15-minute online video of an academic lecture on the topic of horticulture with an online dictionary and a task of 10 multiple-choice questions.

Because of the nature of incidental vocabulary acquisition, that is, vocabulary acquired in the course of concentrating on some other learning goal, completing the CALL activity for the purpose of improving listening would represent the subjects' goal (part 3 above) while investigating incidental vocabulary acquisition through partial dictation tests (part 2 above) would be the researcher's goal.

Types of Materials

It can thus be seen that the present study uses three types of materials, namely the partial dictation, multiple-choice questions, and to discover subjects' thought processes during the CALL activity, the retrospective interview.

According to Henning, Gary, and Gary (1983), the partial dictation is a "narrative passage prepared with a certain number of content words deleted. Subjects are given a written version to read and then they listen to the passage and try to replace the deleted words." (p. 287). In terms of the benefits of the partial dictation, Oller (1979) is of the opinion that it is an integrative test, which Heaton (1988) believes includes "auditory discrimination, the auditory memory span, spelling, the recognition of sound segments, a familiarity with the grammatical and lexical patterning of the language, and overall textual comprehension" (p. 17). This makes the partial dictation an appropriate listening test in general although in the present study, it is its lexical patterning property that is of interest. Even then, however, it should be noted that Heaton's list of the separate skills tested do play a part in vocabulary acquired incidentally via oral input.

For the CALL activity, multiple-choice questions were chosen because "complicated task completion ... may interfere with the listening process" (Brett, 1997: 48). Thus, a test-type which required minimal writing was selected.

Finally, the retrospective interview, which falls into the delayed retrospection category of verbal protocols (Ericsson & Simon, 1993), is used to access subjects' long-term memory regarding their cognitive processes (Gruba, 1997) during the implementation of the CALL activity.

Questionnaire

The questionnaire (Appendix D) consisted of five main sections. The first section asked for subjects' personal characteristics. The second section (Questions 1-5) requested for subjects' thoughts and feelings about English and listening in English, and about computer use. The third section (first part of Question 6) sought to discover subjects' opinions about

both the academic lecture and the tasks involved using a 5-point Likert scale. The fourth section (second part of Question 6) focused on the listening comprehension strategies used to complete the CALL activity, whereby subjects were required to indicate whether they had or had not used a particular learning strategy both before and after the listening activity. Finally, the fifth section (Questions 7-8) provided the opportunity for subjects to write about any technical problems they might have encountered and any opinions they desired to express. It should be noted that the questionnaire was completed prior to the CALL activity except for the highlighted portions (Questions 6, except for the 'Before listening' part, and Questions 7-8) as illustrated in Appendix D which were completed after the CALL activity.

Partial Dictation Tests

The partial dictation tests in the present study were constructed based on partial dictation tests created by Hsu (1994), which was explained in *Chapter 2* (page 10).

To determine the difficulty level of the vocabulary items, the academic lecture was transcribed and the help of nine TESL professors was requested to highlight thirty words/phrases which they thought students would find most difficult (Appendix E). Next, fourteen English 101L students were asked to highlight all the words/phrases they did not know. Then, all the highlighted words were collated and normed (items identified by the professors and students having equal weight), and the top twenty vocabulary items were identified, as shown in Table 3.1:

Table 3.1 Vocabulary items identified for construction of partial dictation tests

1. highly perishable	11. grazing
2. aesthetic purposes	12. zucchini
3. culinary reasons	13. ornamental
4. monastery	14. convent
5. shrubs, landscapes, and lawns	15. domesticated
6. entails	16. horticulture
7. cemetery	17. fiber
8. sustenance	18. nutritional plants
9. turf grass	19. agronomy
10. cultivation	20. harvesting

Next, three partial dictation passages were constructed (Appendixes F, G, and H) using all twenty vocabulary items. Another seven vocabulary items in the pretest and posttest and eight vocabulary items in the delayed posttest found to be difficult were also identified, giving a total of 27, 27, and 28 vocabulary items in the pretest, posttest and delayed posttest respectively. This would make the actual vocabulary items to be tested less obvious, thus protecting the premise of the research question, 'incidental vocabulary acquisition', because if students were tipped-off during the pretest about the vocabulary items they were supposed to acquire, they would have focused on them during the lecture. Finally, it was also found that a single vocabulary item might be used more than once, so all instances of the same word were removed.

Next, a male native speaker of a midwestern variety of English was asked to read the three partial dictation passages twice each, the first reading at a normal reading speed during which subjects were only required to listen without writing anything, and the second time with a pause at the end of each blank. In order to give learners enough time during each pause, the researcher filled in the blanks relatively slowly during the actual recording. The third read-through was a repetition of the first reading, after which the subjects were given three minutes to make final corrections.

The readability statistics of the partial dictation tests are as follows:

Table 3.2 Readability statistics of the partial dictation tests

Readability Statistics	Pretest	Posttest	Delayed Posttest		Pretest	Posttest	Delayed Posttest
Counts							
Words	210	204	200	Words per Sentence	19	18.5	22.2
Characters	1019	1038	1027	Characters per Word	4.7	4.9	5.0
Paragraphs	3	2	1	Readability			
Sentences	11	11	9	Passive Sentences	27%	9%	44%
Averages				Flesch Reading Ease	52	51.9	39.6
Sentences per Paragraph	3.6	5.5	9.0	Flesch-Kincaid Grade Level	10.7	10.6	12.0

Table 3.2 demonstrates that the difference in reading difficulty between the pretest and posttest was negligible, as denoted by the Flesch Reading Ease and Flesch-Kincaid Grade Level statistics. A Flesch-Kincaid Grade Level of 10.7 indicates that the text can be understood by someone who has had 10.7 years of education in the United States.

Academic Lecture

The 15-minute, digitized academic lecture, as shown in Figure 3.1, was presented by a professor in the Horticulture Department at Iowa State University for use in ESL instruction.

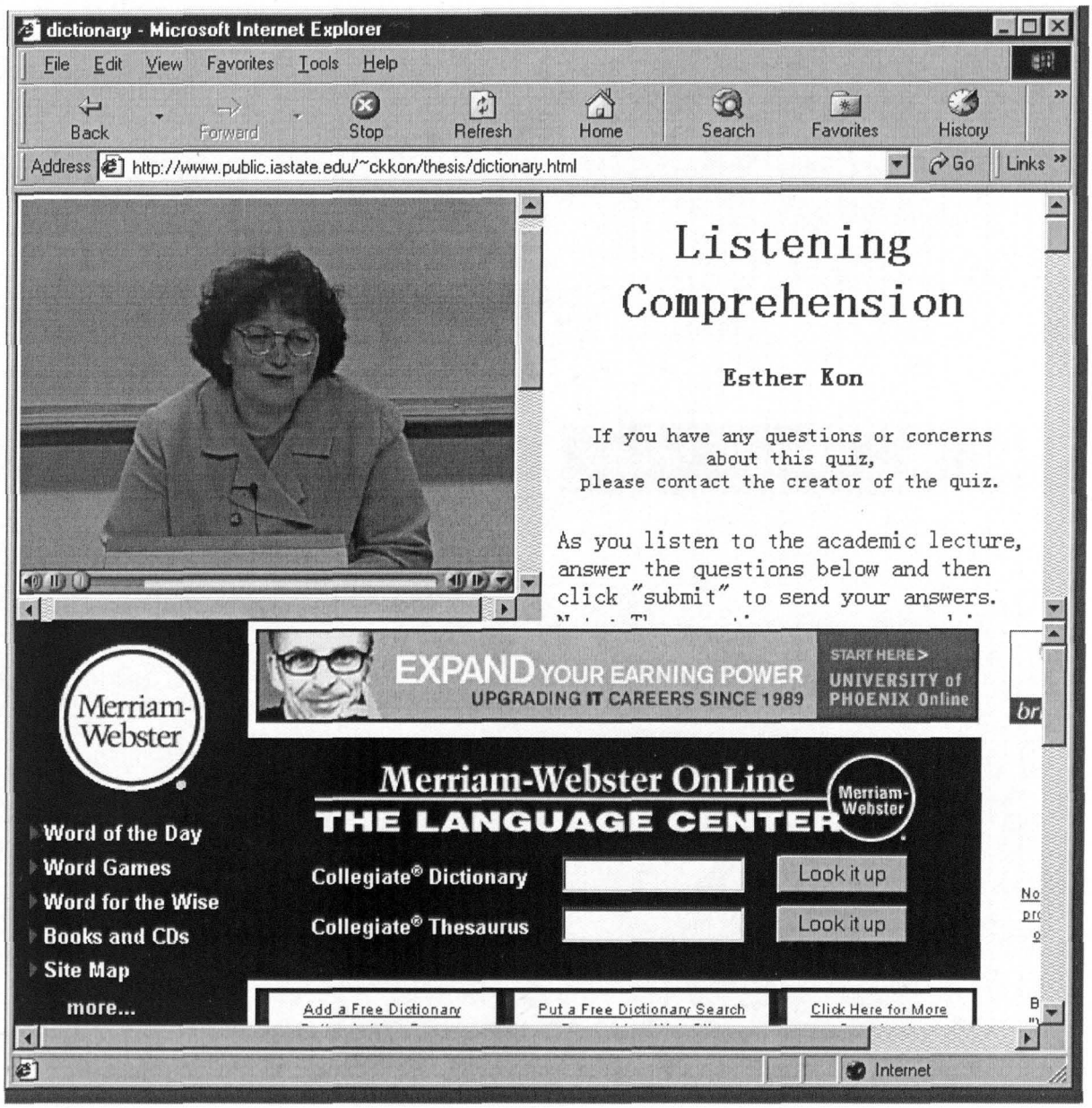


Figure 3.1. Screen-shot of CALL activity

To aid her lecture, she used overhead transparency notes (Appendix I) and picture slides (Appendix J). This means that although the lecture was of a predominantly audio medium, the subjects had access to information being transmitted via other media too, namely the visual medium in the form of words and pictures. Of course, subjects also had recourse to watching the body language and articulation of the speaker.

Also, to encourage autonomous learning, an online dictionary was attached. The purpose was to discover if students would make use of facilities available to them. However, an oversight was that the researcher did not explain to the subjects how to use the online dictionary, which could have influenced subjects' performance.

Multiple-Choice Listening Comprehension Questions

While listening to the academic lecture, the subjects completed ten multiple-choice listening comprehension questions (Appendix K). The principles used to construct the questions were avoiding the actual words in the listening text as much as possible by using synonyms, ensuring that all four answer choices were mentioned in the text, and that the questions were in chronological order. The specific listening skills being focused on included the following:

a) select details from the text; recognize pertinent details in the speech stream (#2,3,4,7,9,10)

b) get the gist or main idea of a passage; find main ideas and supporting details; find the main idea of a lecture segment (#6)

c) recognize the topic; listen to identify the speaker or the topic (#1)

d) make inferences; make inferences about the text (#8) (Peterson, 2001)

e) define a term (#5)

Retrospective Interview Questions

The questions used in the retrospective interview of the nine students were:

1. How would you normally complete a listening comprehension exercise? Listen once through first?

2. How did you go about answering questions?

3. Why did you listen from the beginning again/pause/skip a question/scroll up and down/go to the end/listen repeatedly to a certain portion/etc.?
4. Did you listen and answer questions separately or did you do both simultaneously?
5. Were you listening or reading to obtain the answer?
6. Did you have difficulty matching lecture and questions (getting lost)? How did you feel? How did you deal with that?
7. How did you deal with anything you didn't understand?
8. Why didn't you use the online dictionary?
9. What were the problems you faced in completing the exercise?
10. What were your reactions to technical difficulties/audio problems?

Hardware and Software Configurations

Next, the questions were placed online using Quiz Center http://school.discovery.com/quizcenter/quizcenter.html, an online quiz-making application, which enabled automatic scoring with both researcher and learner getting the scores immediately. Then, a website consisting of the listening text, the multiple-choice listening comprehension exercise, and the online dictionary was created http://www.public.iastate.edu/~ckkon/thesis/dictionary.html (Figure 3.1). In this way, "juxtaposition of audio [and] video input with listening tasks in the same computer interface [and] immediate ... feedback on learner success with tasks is ... provided" (Brett, 1997: 41).

The CALL activity was conducted using a computer laboratory which had PC computers (Dell Optiplex GX110, 20GB HD, 256MB RAM, Windows 98 SE, screen resolution of 1024x768) with Internet access, sound cards, graphics cards, headsets, speakers, microphones, QuickTime software (Version 5.0.2), RealPlayer (Version 8) or Windows

Media Player software (Version 7.01.00.3055), Camtasia Recorder (a PC-compatible screen-capturing software, with the commensurate RAM to accommodate it where a 28-minute audio-visual AVI file could be 472,720 KB), and a cassette recorder. Also, to keep the file sizes manageable, the CALL activity website was restricted to 9¾ inches by 8½ inches, which meant that subjects could only see one multiple-choice question at a time and had to scroll up and down to read the questions that they wanted.

Since Camtasia Recorder needed to capture the audio via a microphone, the logistics of employing the software with a roomful of learners required careful consideration. The researcher finally decided that the CALL activity would be conducted in four sessions of 6-7 students each, with three students in each session being chosen based on their partial dictation pretest scores for the audio-visual screen-capture recording, which meant that these three students would be listening to the academic lecture via speakers while the rest listened through headsets. The decision to use three students per session for the audio-visual screen-capture recording was also made because there were only three CD Writers in the laboratory, which were required to record the AVI files onto CDs.

Camtasia Recorder also required other technical considerations. If the player that is being recorded (Media Player, Real Player, etc.) is using hardware acceleration, that is, if the decoding process is being speeded up, the video will appear blank. Thus, hardware acceleration must be disabled. Also, audio recording only works with the newest version of QuickTime (Version 5.0.2).

Procedures

Learning Task

The research itself took place on three separate days over a 4-week period using two different classes, with thirteen and eleven subjects respectively. The detailed procedure is shown in Table 3.3:

Table 3.3 Procedures for the implementation of the learning task

Day	Activity	Duration	Venue
Day 1	questionnaire, pretest	30 minutes	classroom
Day 2 (two weeks after Day 1)	CALL activity, posttest, remainder of questionnaire (highlighted in Appendix D)	25 minutes 25 minutes	PC computer laboratory
Day 3 (two weeks after Day 2)	delayed posttest	30 minutes	classroom

Before beginning the CALL activity, instructions were given (Appendix L) whereby subjects were asked not to move or resize the CALL activity window and to keep all activity within the fixed region of the screen-capture. They were also taught to start and stop Camtasia Recorder. During the activity, the researcher was responsible for controlling what happened in that all learners had to complete the same activities in a lockstep fashion except for the multiple-choice listening comprehension task which students could complete at their own pace within the 25 minutes allotted.

Retrospective Interviews

Nine students were chosen for audiotaped retrospective interviews (which lasted from thirty minutes to an hour) based on pretest results, with three representatives from the high, intermediate, and low proficiency levels respectively. The personal characteristics of the nine students are as follows:

Table 3.4 Retrospective interviewees' personal characteristics based on partial dictation pretest scores

Proficiency Level	ID#	Native Language	TOEFL	Level of Education	Partial Dictation Pretest[a]	Listening Comprehension[b]
High	S1	Spanish	510	Sophomore	9	9
High	S2	Indonesian	543	Sophomore	9	8
High	S3	Japanese	520	Senior	6	5
Intermediate	S4	Indonesian	503	Freshman	5	8
Intermediate	S5	Japanese	503	Freshman	4	4
Intermediate	S6	Indonesian	533	Freshman	4	9
Low	S7	Chinese	510	Freshman	1	10
Low	S8	Chinese	595	PhD	0	9
Low	S9	Chinese	597	PhD	0	3

Note. n = 9.
[a]Maximum score = 20.
[b]Maximum score = 10.

Based on Table 3.4, some interesting facts arise, especially with regards to English Language proficiency. There was a disparity in terms of subjects' self-reported TOEFL scores, partial dictation pretest scores and listening comprehension scores. The rationale for the choice of the nine subjects is given in the *Methods of Analysis* section on pages 42-43.

In terms of preparing for the interviews, the researcher did so by reviewing the screen-capture recordings and the listening comprehension task results. From the screen-capture recordings, the researcher took note of audio-visual quality and technical difficulties, students' interface with the software, patterns of completing the CALL activity, order of completing the listening comprehension multiple-choice questions, dictionary use, and students' concentration on audio and/or video, the objective being to discover students' rationale for their actions.

Method of Analysis

General, descriptive information was provided by calculating the mean for all the questions in the questionnaire. Scores for incidental vocabulary acquisition were derived through analysis of the partial dictation vocabulary pretest, posttest and delayed posttest. The partial dictation tests were first graded using an absolute correctness strategy. This strategy was chosen because it would be difficult to discern the reasons for the errors made and then to decide if the errors were acceptable for the purpose of this study since the researcher did not teach the subjects and had no knowledge of their problem areas in terms of English proficiency. The data were then keyed in according to vocabulary items per participant

The unit of analysis then changed from subjects to vocabulary items, whereby the data were sorted according to vocabulary items answered correctly and incorrectly in the pretest, focusing on incorrectly answered vocabulary items. Performance of these incorrectly answered vocabulary items on the pretest, posttest and delayed posttest was calculated (using ANOVA) to discover if there were significant differences between the three tests. Then, looking only at the pretest results of the incorrectly answered vocabulary items (i.e. score = 0), correlation (using the phi-coefficient) and statistical significance (using the chi square) were calculated between the posttest and delayed posttest, in accordance with the study's stated objective of investigating incidental vocabulary acquisition.

Students might have acquired some of the vocabulary items through the written mode, namely the multiple-choice listening comprehension questions and the overhead transparency notes used by the speaker. Thus, the specific vocabulary items used in the questions and the transparency notes were identified and the performance of subjects on these vocabulary items were compared.

Another consideration was whether looking up a specific item on the online dictionary would encourage incidental vocabulary acquisition. Thus, from the screen-capture recordings of the nine subjects specifically chosen for retrospective interviews, a comparison between the words looked up and the respective students' performances on the specific words were compared.

For listening comprehension, the responses to the multiple-choice listening comprehension data were first keyed in according to the answer choices of A, B, C, and D before being translated into correct (1) or incorrect (0) answer choices.

The questions were also sorted according to the three media from which the answers could be obtained, whereby one medium might be more suitable for one specific question than for another. The answers to questions that can be obtained via the audio medium are items 1, 4, 9, and 10, while those from the transparency medium are items 2, 3, 5 and 8, and finally those obtained through the use of slides are items 6 and 7. The question that arose was whether the medium in which the answer could be obtained had any effect on the performance of the subjects.

For investigation of the nine subjects' listening comprehension strategies, all the interviews were transcribed and main and recurrent ideas were obtained. These include:

1. The strategies subjects used to answer questions divided into strategy type.
2. The strategies subjects used to answer questions compared according to item number.
3. Listening once through the academic lecture before answering questions; restarting.
4. Problems faced, including technical difficulties.
5. The influence of technical know-how on subjects' performance.

6. Did/did not read instructions and influence on subjects' performance.
7. Reference to academic lecture or lack thereof while answering questions.
8. Ease or difficulty of text and task.
9. Response to unknown words.
10. Use of online dictionary.
11. Subjects' awareness that questions were in chronological order.
12. The order by which listening comprehension questions are answered and the number of times they are attempted.
13. Subjects' opinions of the text and task.

Next, ideas according to subject proficiency levels based on the partial dictation pretests were obtained, with three students at each of the three proficiency levels (refer to Table 3.4 on page 39 for the personal characteristics of these subjects). Before going on, however, a rationale for the plan of action detailed later seems to be in order. The nine students chosen for retrospective interviews were selected based on their partial dictation pretest scores and not on their self-reported TOEFL scores because it is the objective of the present study to concentrate specifically on the listening skill and incidental vocabulary acquired via listening. Also, the pretest scores were selected because it was necessary for the nine students to have been chosen prior to the implementation of the CALL activity. This was because special arrangements had to be made to screen-capture the chosen subjects' CALL activities. It was discovered that there was a discrepancy between the pretest scores obtained before and the listening comprehension scores obtained during the CALL activity in that the subjects' listening comprehension scores did not tally with the proficiency levels based on pretest scores. Thus, the data had to be reanalyzed based on subjects' listening

comprehension scores. Here, because there were six students at the high end and three students at the low end, the three advanced students were selected based on listening comprehension and TOEFL scores. The personal characteristics of these subjects, based on Table 3.4, are as follows:

Table 3.5 Retrospective interviewees' personal characteristics based on listening comprehension scores

Proficiency Level	ID#	Native Language	TOEFL	Level of Education	Partial Dictation Pretest[a]	Listening Comprehension[b]
High	S7	Chinese	510	Freshman	1	10
High	S6	Indonesian	533	Freshman	4	9
High	S8	Chinese	595	PhD	0	9
Low	S3	Japanese	520	Senior	6	5
Low	S5	Japanese	503	Freshman	4	4
Low	S9	Chinese	597	PhD	0	3

Note. n = 6.
[a]Maximum score = 20.
[b]Maximum score = 10.

Next, main ideas of the retrospective interviews based on subjects' partial dictation pretest and listening comprehension scores were collated, a sample of which is in Table 3.6:

Table 3.6 Main ideas of retrospective interviews according to subjects' proficiency levels based on partial dictation pretest and listening comprehension scores

	Partial Dictation Pretest						Listening Comprehension				Total
	Advanced		Intermediate		Beginners		Advanced		Beginners		
Listening Comprehension[a]	7		7		7.3		9.3		3.7		
Vocabulary (Pretest, Posttest, Delayed Posttest)[b]	9.8		6.4		1.3		3		5.2		
	Qn	Total	Qn	Total	Qn	Total	Qn	Total	Qn	Total	
1. Audio (#1, 4, 9, 10)	#7	3	#4	1	#4	1	0	0	#4	1	10
	#9	1	#5	1					#5	1	
			#9	1							
6. Listened, then answered questions	1		0		0		0		1		

Note.
[a]Average scores of 3 subjects. n = 10.
[b]Average scores of 3 subjects. n = 20.
Qn = Question item

The main ideas of the retrospective interviews are arranged in three different ways. Firstly, there are the average listening comprehension and partial dictation scores. Secondly, there is the division of the ten multiple-choice listening comprehension answers into the media from which the answers are obtained, whereby the question item and the number of times a certain item is answered using a particular medium are given. Thirdly, there are the specific strategies reported by the nine retrospective interviewees. Item 6, for example, reveals that for the strategy of listening to the academic lecture once through before answering questions, there is one instance in the partial dictation pretest advanced group while in the listening comprehension group, that one instance is performed by the beginner subject.

For the purpose of triangulation, the analysis obtained here was then compared with the fourth section of the questionnaire mentioned earlier, where subjects indicated whether they had or had not used a particular learning strategy both before and after the listening activity.

A descriptive analysis of the main ideas found in the retrospective interviews were also obtained. The main ideas included learning strategies, technical difficulties, problems of non-technical origin, the use or lack thereof of the online dictionary, response to unknown words, and subjects' opinions of the CALL activity. Here, the third and fifth sections of the questionnaire proved useful. The third section sought to discover subjects' opinions of both the academic lecture and the tasks involved using a 5-point Likert scale. Thus, the mean of the different variables could be obtained. Section five, on the other hand, provided subjects with the opportunity to write about any technical problems they might have encountered and any opinions they desired to express.

Other considerations included a comparison of partial dictation, listening comprehension and TOEFL scores, specific vocabulary item performance on the partial dictation, listening comprehension and online dictionary, and learning strategies from the retrospective interviews and the questionnaires.

CHAPTER 4. RESULTS AND DISCUSSION

This study investigates the effectiveness of a CALL listening comprehension activity using an online video of an academic lecture to promote incidental vocabulary acquisition and listening comprehension via partial dictation vocabulary tests and ten multiple-choice listening comprehension questions respectively. The study also looks at the listening strategies employed to complete the activity and the influence these have on subjects' performance. To determine the effectiveness of the activity, both quantitative and qualitative data were collected and analyzed. This chapter discusses the results of the analysis and addresses the two research questions presented in *Chapter 1*. It is divided into three sections, a section on subjects' perception about English and the CALL activity, followed by two sections for each of the two research questions.

Subjects' Perception about English and the CALL Activity

The general, descriptive information aims to provide a more complete picture of subjects' English proficiency level and their readiness to complete the CALL activity. This information comes mainly from the questionnaire and can be divided into two parts, 1) the mean derived from questions such as subjects' self-assessment about English and listening in English, and about computer use, and 2) the mean derived from questions like subjects' perception about the academic lecture and its corresponding tasks, as shown in Table 4.1:

Table 4.1 Mean of different questions

Subjects' thoughts and feelings	*M*	*SD*
1. I am good at listening to English.	3.2	0.98
2. I love listening to English.	2.3	1.12
3. I study English alone a lot/never.	2.8	0.92
4. I practice listening alone a lot/never.	3.1	1.02
5. I am good at using the computer and Internet.	1.9	1.03
6. I love using the computer and Internet.	1.6	0.93
Subjects' opinions	*M*	*SD*
7. The listening texts are easy.	2.8	0.74
8. The listening texts are relevant to my needs.	2.8	1.02
9. The listening texts are enjoyable.	2.7	1.01
10. The listening texts give me complete control over my learning.	2.5	0.93
11. The listening texts allow me to work at my own speed.	2.4	0.88
12. The listening texts require too much time.	2.6	0.78
13. The listening texts will improve my English.	2.3	0.96
14. The listening texts will improve my listening skills.	2.3	1.09
15. The assignments are easy.	2.8	1.01
16. The assignments are relevant to my needs.	2.8	1.09
17. The assignments are enjoyable.	2.6	1.25
18. The assignments give me complete control over my learning.	2.4	1.25
19. The assignments allow me to work at my own speed.	2.1	1.25
20. The assignments require too much time.	2.5	1.14
21. The assignments will improve my English.	2.2	1.14
22. The assignments will improve my listening skills.	2.3	1.15

Note. n = 24.

The questions in Table 4.1 were measured using a 5-point Likert scale, with 1 referring to 'strongly agree' and 5 representing 'strongly disagree'. Therefore, a mean of below 3.0 would signify a positive response by the subjects. A description of the questions follows.

Subjects were a little negative about their English listening skills (#1). However, their opinions about the efficacy of the listening text and assignment to improve their English (#13 and #21) and listening skills (#14 and #22) were more positive. Placed in a class which had the express purpose of improving the subjects' listening skills, it is reasonable to expect that the subjects might be dissatisfied with their level of listening proficiency, and that they would have a positive mindset regarding the listening text and assignment.

They also had favorable emotional reactions about listening to English (#2) and about text and assignment relevance and enjoyment. Indeed, the interplay of these factors might have influenced subjects' performance on the CALL activity. Also, the relative importance of these factors would have to be considered in the construction of a good CALL activity.

Subjects found the listening text and assignment (#7 and #15) a little easy, which would pre-empt frustration but not so easy that they would invite boredom. However, even then, perhaps the difficulty level could have been increased a little to provide challenge to the students. This is in line with Krashen's $i+1$ hypothesis (Krashen, 1981).

Subjects thought that the text and assignment were a little time-consuming (#12 and #20) although the ratings were midway between "Agree" and "Neutral". This response is curious since subjects only had 25 minutes to complete the CALL activity. Conversely, they could have been considering the time commitment of the whole study, which lasted 1 hour 50 minutes in total over a 4-week period.

Subjects "sometimes" studied English (#3) and practiced listening (#4) alone although the text and assignment did give subjects control over their learning (#10 and #18) and allowed them to work at their own speed (#11 and #19). These factors would have to be borne in mind when considering the use of CALL activities as homework or autonomous, self-assessed activities.

Finally, subjects worked with computers approximately 3.0 hours per day. They were confident about their ability (#5) and had a positive attitude (#6) about the use of the computer and Internet. In fact, these are the most positive responses in this portion of the study. It may be inferred, therefore, that the subjects were familiar with computers and

possessed some technical know-how, which would influence their performance on the CALL activity.

Having obtained some general, descriptive information about subjects' perception of English and the CALL activity, we can now move on to the investigation of the actual research questions.

The Potential of a Student-Controlled Authentic Listening Text that is Not Modified for the Purpose of ESL Instruction to Facilitate Language Learning

The first research question seeks to discover whether the listening text in question would facilitate language learning, which is investigated from two perspectives, namely incidental vocabulary acquisition and listening comprehension.

Incidental Vocabulary Acquisition

To answer the research question of whether an online video of an academic lecture can facilitate incidental vocabulary acquisition, the partial dictation vocabulary tests were used to calculate whether there were significant improvements between subjects' overall performance on the pretest, posttest and delayed posttest. Then, the pretest results of subjects who had answered vocabulary items incorrectly (i.e. score = 0) were used to calculate whether there was significant improvement between the posttest and delayed posttest. The presence of significant improvements would show that the listening text did indeed facilitate incidental vocabulary acquisition.

Overall Performance on Partial Dictation Tests

The overall performance of all the subjects on the three partial dictation tests is found on Table 4.2:

Table 4.2 Mean of partial dictation vocabulary pretest, posttest, and delayed posttest scores

Test	Possible Number of Items	Mean	Standard Deviation
Pretest	20	3.8	2.89
Posttest	20	7.0	3.34
Delayed Posttest	20	6.8	3.91

Note. n = 24.

The mean performance of all the subjects increased from 3.8 on the pretest to 7.0 on the posttest, or in terms of percentage, from 19% to 35%, suggesting that the CALL activity did indeed facilitate incidental vocabulary acquisition. The decrease of the mean from 7.0 (35%) on the posttest to 6.8 (34%) on the delayed posttest was not statistically significant. Thus, the ANOVA statistical test performed on the three tests (p-value < .002) proves that there was a difference between the pretest and the posttest and the pretest and the delayed posttest.

Incorrectly Answered Pretest Vocabulary Items and Corresponding Performance on Posttest and Delayed Posttest

Table 4.3 refers to the number of vocabulary items answered correctly and incorrectly during the posttest and delayed posttest given that they were incorrectly answered on the pretest. It should be noted that the unit of analysis here changed from subjects to vocabulary items (refer to *Chapter 3*, page 40). Thus, there are four possible combinations:

1. Vocabulary items incorrectly answered in both the posttest and delayed posttest
2. Vocabulary items correctly answered in the posttest but incorrectly answered in the delayed posttest
3. Vocabulary items incorrectly answered in the posttest but correctly answered in the delayed posttest
4. Vocabulary items correctly answered in both the posttest and delayed posttest

Table 4.3 Number of vocabulary items answered incorrectly during pretest

	Posttest incorrect		Posttest correct		Total	
	#	%	#	%	#	%
Delayed posttest incorrect	262	67.4	39	10.0	301	77.4
Delayed posttest correct	34	8.7	54	13.9	88	22.6
Total	296	76.1	93	23.9	389	100.0

Note. n = 389. # = Number of vocabulary items.

From the sample of incorrectly answered vocabulary items during the pretest, 67.4% of the vocabulary items were still incorrectly answered at both the posttest and delayed posttest levels. However, this means that 32.6% (combinations 2, 3, and 4 above) of the vocabulary items were successfully acquired at some point as evidenced by the vocabulary items being correctly answered at the posttest and/or delayed posttest. Furthermore, 22.6% of the items were retained, that is, the vocabulary items were correctly answered at the delayed posttest level. While the failure rate of 67.4% appears high, the fact remains that 32.6% of the items were acquired, which suggests that the CALL activity was able to facilitate incidental vocabulary acquisition. This is in line with previous research based on the hypothesis that input is a necessary, though not sufficient condition for acquisition (Ellis, 1994b). This means that vocabulary acquisition did occur as a result of the input provided by the listening text although the fact that some subjects were not able to retain the vocabulary items acquired earlier illustrates that other conditions beyond input are required for

acquisition. However, it would be important to discover specifically why the rate of incidental vocabulary acquisition was not higher and how it could be improved.

Furthermore, Kramer's phi coefficient, which was used to calculate the correlation between the partial dictation posttest and delayed posttest vocabulary items, was 0.4748. With a p-value of < 0.0001 and a chi-square of 87.69, there is a significant difference.

Results Compared according to Audio and Written Modes

Interesting information was also obtained from a comparison of the performance on vocabulary items identified as being: 1) mentioned only in the audio-visual academic lecture, or 2) employed in the multiple-choice listening comprehension questions or 3) the overhead transparency notes used by the speaker, or 4) in both the listening comprehension questions and the overhead transparency notes, as revealed in Table 4.4.

Table 4.4 Percentage of partial dictation vocabulary items answered correctly based on audio and written modes

Average of Partial Dictation Tests Scores	Audio and Video[a] (%)	Written Questions[b] (%)	Overhead Transparency Notes[c] (%)	Both Written Questions and Overhead Transparency Notes[d] (%)
Pretest	15	17	22	38
Posttest	23	38	43	71
Delayed Posttest	25	32	39	67

Note. n = 24.
[a]Number of vocabulary items = 10.
[b]Number of vocabulary items = 4.
[c]Number of vocabulary items = 5.
[d]Number of vocabulary items = 2.

Thus, subjects performed progressively better if the vocabulary items appeared in more than one mode. In other words, a vocabulary item that was mentioned only in the audio-visual mode had a lower chance of being acquired than one which was also used in a written mode. The latter vocabulary item again had a lower chance of being acquired than

one which appeared in a written mode in two forms, namely in the listening comprehension questions and in the overhead transparency notes. However, it is interesting to note that a vocabulary item mentioned in the listening comprehension questions had a lower chance of being acquired than one used in the overhead transparency notes. Perhaps subjects considered the overhead transparency notes to be part of the information being disseminated through the lecture whereas the listening comprehension questions' role was to guide them in obtaining the said information. Also, it is interesting to note that the delayed posttest scores were lower than the posttest in every case except for the audio-visual mode.

The trend in the performance of subjects on the partial dictation tests based on access to the visual and written modes is supported by literature which states that the visual aspect of the academic lecture either supports or is integral to language learning as measured by incidental vocabulary acquisition. Also, included in this additional access beyond the audio medium is the idea of exposure to input, in that the greater the exposure to input, the more likely it is that the vocabulary item would be acquired. However, the possibility that incidental vocabulary acquisition increases progressively with the use of the vocabulary item in the multiple-choice questions, overhead transparency notes, and in both the questions and the notes, requires more research than is presently available.

Online Dictionary Use

The research question stresses the student-controlled nature of the listening text and task and one of its features would be the possibility of online dictionary use and its effect on incidental vocabulary acquisition. The information for this aspect of the research question is obtained only from the screen-capture recordings and retrospective interviews of nine

subjects out of the total 24 participants, the method of selection and personal characteristics of which are explained in *Chapter 3,* pages 38-39.

Based on the nine screen-capture recordings, there was minimal use of the online dictionary - only three subjects looked up a total of five words altogether, and of the five words, only two, 'culinary' and 'horticulture', were used in the partial dictation tests. Therefore, the findings arrived at were inconclusive.

The nine retrospective interviews revealed subjects' reasons for the lack of online dictionary use. One subject stated that he did not think he needed to use the dictionary, which was proven by his perfect score on the listening comprehension exercise. Another confessed to not being able to concentrate on the lecture if she was using the dictionary at the same time, not knowing that she could have paused the audio to use the online dictionary. A third feared messing things up. Thus, technical knowledge would be an influential factor with regards to online dictionary use. One student admitted to not knowing about the online dictionary and would not use it even if he did know because of the researcher's previous command not to use electronic dictionaries during partial dictation tests. The subject considered the CALL activity a test too. Other methods of dealing with unknown vocabulary, like guessing meaning from context and using the dictionary only if unable to do so, would also be a factor.

For those who used the online dictionary, one said that she understood the dictionary but also guessed from context while another complained that he could not really understand the dictionary because the explanation was in English and that it was too short. Instead, he preferred to guess the meaning of unknown words from the lecture where there was enough context for him to do so.

Listening Comprehension

To answer the research question of whether a CALL listening text can be used to facilitate listening comprehension, subjects' overall performance on the ten multiple-choice listening comprehension questions were analyzed. Subjects' performance on the questions based on the media (audio, overhead transparency, picture slides) from which the answers could be obtained was also compared to discover if media had an effect on performance.

Overall Performance on Multiple-Choice Listening Comprehension Task

The subjects obtained a mean of 7.1 which can be interpreted to signify that there was a 71% success rate, that is, subjects were able to correctly answer a large proportion of the multiple-choice listening comprehension questions. A possible rationale for this is that subjects were able to understand the academic lecture and successfully perform the attendant task.

In order to discover if there was a relationship between the partial dictation vocabulary pretest and listening comprehension scores, the correlation between subjects' pretest and listening comprehension scores were calculated using the Pearson Correlation Coefficients. The correlation was found to be -0.06421 and not significant. Explanation of this occurrence is given during the discussion of the second research question.

Results Compared according to Media Type

Next, the effect of media type on subjects' performance was considered, as shown in Table 4.5:

Table 4.5 Percentage of listening comprehension items answered correctly based on medium used

	Audio[a] (%)	Transparency[b] (%)	Slides[c] (%)
Percentage of questions answered correctly	68	72	77

Note. n = 24.
[a]Number of listening comprehension items = 4.
[b]Number of listening comprehension items = 4.
[c]Number of listening comprehension items = 2.

Table 4.5 demonstrates that the chances of listening comprehension questions being answered correctly were higher for answers found in the transparency medium than in the audio medium, and for those found in slides than in transparencies. It seems reasonable that the answer might be more easily found in the written mode (transparency) than in the audio mode, especially since the subjects came from a class designed to improve their listening skills. This result is comparable to the results for partial dictation test scores based on media discussed on pages 52-53. This is again evidence in support of literature which states that the visual aspect of the academic lecture either supports or is integral to language learning as measured by listening comprehension. However, the reason for the highest average found in the slides medium is more difficult to explain. Perhaps the fact that there were only two questions where the answers could be obtained through the slides medium while there were four questions each for the audio and transparency media might have influenced the results.

Listening Strategies used to Complete a CALL Activity based on an Authentic Listening Text

The listening strategies used to complete the CALL activity were obtained from the retrospective interviews of nine students chosen based on their partial dictation vocabulary pretest scores (three subjects of advanced, intermediate, and beginner proficiency levels

respectively). However, before going into the specific results of the strategies, some general, descriptive information is provided:

Table 4.6 Partial dictation pretest and listening comprehension scores based on subjects' proficiency levels

	Partial Dictation Pretest			Listening Comprehension	
	Advanced (n = 3)	Intermediate (n = 3)	Beginners (n = 3)	Advanced (n = 3)	Beginners (n = 3)
Average self-reported TOEFL scores	524	513	567	546	540
Average Listening Comprehension[a] scores	7.0	7.0	7.3	9.3	3.7
Average Vocabulary[b] (Pretest, Posttest, Delayed Posttest) scores	9.8	6.4	1.3	3.0	5.2

Note.
[a]Maximum score = 10.
[b]Maximum score = 20.

Table 4.6 reveals that very different results were obtained based on the nine subjects' proficiency levels in the partial dictation pretest and listening comprehension. It is reasonable to assume that the mean scores of the three partial dictation vocabulary tests would correspond with the partial dictation pretest scores based on proficiency level in that the advanced students would score better than the intermediate students who would in turn score better than the beginners. Similarly, the mean scores of the listening comprehension would also be based on proficiency level. However, an interesting phenomenon occurred when the listening comprehension scores of the subjects divided into proficiency levels based on vocabulary tests were compared - there did not appear to be much difference, with a mean of 7.0, 7.0 and 7.3 respectively. In fact, the highest mean of 7.3 was obtained by the beginners. This could be explained by the fact that the beginners obtained the highest average TOEFL scores. When the average vocabulary test scores of subjects divided into proficiency levels based on listening comprehension scores were compared, an even more interesting

phenomenon arose. The beginners, with a mean of 5.2, did better than the advanced students who had obtained a mean of 3.0. This suggests that subjects can have different proficiency levels according to the different skills and abilities tested. However, in comparing the average scores of TOEFL, listening comprehension and vocabulary, it appears that the listening comprehension scores more closely resembled the self-reported TOEFL scores. A possible explanation might be that there was an overlap of skills being tested. Indeed, listening is one of the components being tested in TOEFL, carrying one-third of the TOEFL scores since the total TOEFL score can be computed using the following formula:

$$\frac{[(\text{Listening} + \text{Structure/Writing} + \text{Reading}) \times 10]}{3}$$

Furthermore, among the stimuli provided for the testing of listening in TOEFL is academic discussion, which is related to the text-type used in the present study, the academic lecture.

The reasons for the discrepancy mentioned above and the subsequent effort to resolve it for the purpose of data analysis are covered in *Chapter 3*.

Strategy Use based on Media Type

Table 4.7 Use of different media to answer listening comprehension questions based on partial dictation pretest and listening comprehension proficiency levels

	Partial Dictation Pretest[a]						Listening Comprehension[b]				Total
	Advanced		Intermediate		Beginners		Advanced		Beginners		
	Qn	Total	Qn	Total	Qn	Total	Qn	Total	Qn	Total	
1. Audio (#1, 4, 9, 10)	#7 #9	3 1	#4 #5 #9	1 1 1	#4	1	0	0	#4 #5	1 1	10
2. Transparency (#2, 3, 5, 8)	#2 #5	1 1	#2	1	#1 #2 #3 #5	1 1 1 1	#1 #2 #3 #5	1 1 1 1	#1	1	12
3. Slide (#6, 7)	0	0	#7	1	#3 #5 #6	1 1 2	#6	2	#3 #5 #7	1 1 1	10
4. Both audio and transparency (#2, 3, 5, 8)	#5	1	#2 #3 #4	1 1 1	#2	1	0	0	#2 #5	1 1	7
5. Both audio and slide (#6, 7)	#6	2	#6 #7	1 1	0	0	0	0	#6	2	6

Note. n = 9.
[a]Number of subjects = 9.
[b]Number of subjects = 6.
Qn = Question.

Table 4.7 details attempts to answer listening comprehension questions by subjects divided according to proficiency levels of partial dictation vocabulary pretest and listening comprehension. These questions are listed based on the media subjects used to answer them, that is, the item number and the number of times a particular item was attempted using a specific media. The correct questions where the answers can actually be found in the different media are also provided.

It is interesting to note that in the use of the various media, namely audio-visual, transparencies and slides, to answer listening comprehension questions, some of the low proficiency students according to both the pretest and listening comprehension answered questions by referring to the wrong media. Examples include using the transparency to

answer question 1 and using slides to answer questions 3 and 5. This suggests that inability to utilize the correct media to obtain answers may be one of the characteristics of beginners.

Having considered the influence of media type on strategy use, the actual listening strategies employed are discussed next.

Strategies Reported in the Retrospective Interviews

The actual strategies used by subjects as reported in the retrospective interviews and expressed in the researcher's own words fall into several categories. These strategies were placed into the categories by comparing them against the definitions and examples of different strategies provided by Vandergrift's (1997) model (refer to Appendix A). The inter-rater reliability is as follows:

Table 4.8 Inter-rater reliability of strategies reported in the retrospective interviews

	Rater 1	Rater 2	Rater 3
Rater 1	1.000		
Rater 2	0.483	1.000	
Rater 3	0.384	0.571	1.000

The highest inter-rater reliability, 0.571, is between raters 2 and 3. The inter-rater reliability is not very high because the researcher had not elected to train the raters beforehand.

Within the metacognitive category, the strategies and sub-strategies according to Vandergrift's (1997) model as reported in the retrospective interviews are:

Table 4.9 Metacognitive strategies and sub-strategies reported in the retrospective interviews

Metacognitive strategy	Examples in retrospective interviews
Planning	
Directed attention	1. Didn't worry about not finding answer, just concentrated on listening 2. Listened, then answered questions 3. Didn't listen too carefully 4. Didn't pay attention
Selective attention	5. Didn't refer to audio/video 6. Focused more on audio on second listen through 7. Careful reading of question 8. Depended on exact words 9. Looked for specific vocabulary 10. Find keywords 11. Didn't manage to answer because still thinking about previous question
Self-management	12. Answer easy questions first – skipped difficult questions 13. Skipped because wasn't paying attention
Monitoring	
Double-check monitoring	14. Listened again 15. Heard word and rechecked question
Evaluation	
Performance evaluation	16. Chose answer because of completeness 17. Certain of answer 18. Uncertain of answer

Many of the metacognitive strategies chosen appear to be test-taking strategies as well, as shown by items 1, 2, 6, 7, 12, 13, and 16. Furthermore, some of the example strategies are negative examples, in that they illustrate how the failure to carry out the strategies mentioned might adversely affect performance (items 3, 4, 5, and 11). Thus, there might have been a learning effect being experienced by subjects in that they had assessed their performance and realized their errors, enabling them to articulate the errors.

Examples of cognitive strategies mentioned in the retrospective interviews include:

Table 4.10 Cognitive strategies and sub-strategies reported in the retrospective interviews

Cognitive strategy	Examples in retrospective interviews
Inferencing	
Linguistic inferencing	1. Guessed 2. Didn't know vocabulary 3. Got confused by synonym
Extralinguistic inferencing	4. Used answer choices 5. Familiarized himself with questions 6. Read questions and answer choices 7. Read questions but not answer choices 8. Matched lecture to questions 9. Matched questions to lecture 10. Memorized questions 11. Proximity of answers in lecture helped 12. Didn't read complete question
Between parts inferencing	13. Mismatched 14. #4 – end of lecture
Elaboration	
Academic elaboration	15. Rationalized 16. Own knowledge
Summarization	17. Paused 18. Memorized lecture 19. Remembered part of answer 20. Remembered words
Resourcing	21. Online dictionary
Grouping	22. Has mental concept of division of chunks of information

Extralinguistic inferencing featured greatly in the reported cognitive strategies. Subjects made use of all resources at their disposal, the listening comprehension questions and their answer choices, and the academic lecture. An interesting phenomenon arose with the practice of between parts inferencing, in that there were mismatches between the multiple-choice questions and the answers obtained from the academic lecture. The most obvious example of this was obtaining the answer to question 4 from the end of the academic lecture when the correct answer was found nearer the beginning of the lecture since the questions were arranged in chronological order.

A summary of the metacognitive and cognitive strategies and sub-strategies reported in the retrospective interviews are found as follows:

Table 4.11 Summary of metacognitive and cognitive strategies reported in the retrospective interviews

Metacognitive strategy	Frequency	Percentage	Cognitive strategy	Frequency	Percentage
Planning			Inferencing		
Directed attention	4	10.0	Linguistic inferencing	3	7.5
Selective attention	7	17.5	Extralinguistic inferencing	9	22.5
Self-management	2	5.0	Between parts inferencing	2	5.0
Monitoring			Elaboration		
Double-check monitoring	2	5.0	Academic elaboration	2	5.0
Evaluation			Summarization	4	10.0
Performance evaluation	3	7.5	Resourcing	1	2.5
			Grouping	1	2.5
Total	18	45.0	Total	22	55.0

Note. n = 24.

Table 4.11 shows that there were 40 different listening strategies as expressed in the researcher's own words mentioned in the retrospective interviews, of which 18 (45%) were metacognitive strategies while 22 (55%) were cognitive strategies. This is in line with Vandergrift's (1997) research findings which discovered that cognitive strategies were reported most often, followed by metacognitive strategies. The top three metacognitive strategies were selective attention, directed attention and performance evaluation strategies. These three strategy types made up 35.0% of the total strategies mentioned, or 77.8% of the metacognitive strategies mentioned. The top three cognitive strategies, on the other hand, were extralinguistic inferencing, summarization and linguistic inferencing strategies, which made up 40.0% of the total strategies mentioned, or 72.7% of the cognitive strategies mentioned. Again, this is similar to Vandergrift's finding that the most reported cognitive strategies in descending order include summarization, elaboration, and inferencing, although in the present study, there was no mention of elaboration strategies. Also, inferencing strategies were more often used than summarization strategies.

Recurrent Ideas in the Retrospective Interviews

An analysis of recurrent ideas expressed during the retrospective interviews provided the following data:

Table 4.12 Recurrent ideas expressed during retrospective interviews arranged in order of frequency

Recurrent Ideas	Partial Dictation Pretest[a]			Listening Comprehension[b]		Total
	Advanced	Intermediate	Beginners	Advanced	Beginners	
1. Listened again	3	9	8	11	1	32
2. Guessed	4	8	2	6	2	22
3. Didn't refer to audio/video	3	4	2	3	5	17
4. Mismatched	1	4	5	3	3	16
5. Memorized lecture	3	3	0	0	2	8
6. Didn't know vocabulary	0	1	2	1	3	7
7. #4 – end of lecture	0	0	2	2	2	6
8. Answer easy questions first – skipped difficult questions	3	0	1	1	1	6
9. Paused	0	4	0	1	0	5
10. Heard word and rechecked question	2	1	0	2	0	5
11. Remembered words	3	0	0	0	2	5
12. Own knowledge	0	1	2	0	2	5

[a]Number of subjects = 9.
[b]Number of subjects = 6.

Four separate behaviors (items 1-4) were mentioned most frequently, namely listening again, guessing, not referring to the audio/video when answering questions, and using the wrong audio-visual section to answer questions, mentioned 32, 22, 17, and 16 times, respectively. The next group of behaviors (items 5-12) were those which were mentioned 5-8 times during the retrospective interviews, namely memorizing the lecture, not knowing vocabulary items, answering question 4 based on the end of the lecture (when the answer was actually found earlier in the lecture), answering easy questions first and skipping difficult questions, pausing, hearing words and rechecking questions, remembering words, and referring to subjects' own knowledge.

From the information in Table 4.12, it is possible to analyze the strategies used according to partial dictation pretest and listening comprehension proficiency levels. The analysis is summarized in Table 4.13:

Table 4.13 Most frequent recurrent ideas arranged according to subjects' proficiency levels

Recurrent Ideas	Strategy Categories	Low PD, high LC	High PD, low LC	High PD, high LC	Low PD, low LC	Total
1. Listened again	M-Monitoring	√				32
2. Mismatched	C-Inferencing	√[a]				16
3. Memorized lecture	C-Summarization		√			8
4. Remembered words	C-Summarization		√			5
5. Heard word and rechecked question	M-Monitoring			√		5
6. Guessed	C-Inferencing			√		22
7. Didn't know vocabulary	C-Inferencing				√	7
8. Own knowledge	C-Elaboration				√	5

Note.
M - Metacognitive strategies
C - Cognitive strategies
PD – Partial dictation
LC – Listening comprehension
[a]No difference in conduct in terms of listening comprehension proficiency

Because of the small number of subjects involved, the conclusions drawn are tentative and would require further research. However, even so, some patterns are observable. Six of the eight most frequent recurrent ideas fall under the cognitive category, which again supports Vandergrift's (1997) research findings mentioned earlier. Furthermore, the cognitive strategies mentioned in Table 4.13 (summarization, elaboration, inferencing) are also the three most frequently reported cognitive strategies in literature (Vandergrift, 1997).

Also, within the general category of metacognitive strategies, only monitoring, a type of planning strategy, is mentioned. This is in line with research findings (Vandergrift, 1996).

In terms of strategy choice according to proficiency level, the low partial dictation (PD) and high listening comprehension (LC) proficiency group and the high PD high LC group both used monitoring and inferencing strategies most frequently (represented by ideas #1 and #2, and #5 and #6 respectively). The difference between these two groups lies in their PD proficiency. It is uncertain if this makes a difference in terms of their strategy choice. However, the fact that both groups have high LC proficiency is significant and bears further investigation. The conclusion could be drawn that students with high LC proficiency seem to use monitoring and inferencing strategies more frequently.

The two remaining groups, the high PD low LC and the low PD low LC groups, on the other hand, appear to favor cognitive strategies (represented by ideas #3 and #4, and #7 and #8 respectively). However, the high PD low LC group uses summarization strategies most while the low PD low LC group gravitates towards inferencing and elaboration strategies. Again, the difference between these two groups lie in their PD proficiency and the conclusion might be drawn that low LC proficiency students seem to prefer cognitive strategies.

Furthermore, a comparison between the high (high PD high LC) and low (low PD low LC) performing groups shows that the high performing group uses both metacognitive and cognitive strategies while the low performing group uses cognitive strategies, which supports research findings which state that intermediate listeners use metacognitive strategies while novice listeners use cognitive strategies (Vandergrift, 1997). Indeed, according to O'Malley & Chamot, 1990 and Vandergrift, 1997, the biggest difference between successful and less successful listeners appears to be the use of metacognitive strategies. The present study seems to support this conclusion.

Strategy Use in the Questionnaire

Besides the nine retrospective interviews, subjects' listening strategies were also obtained from the fourth section of the questionnaire completed by all 24 participants, where subjects were provided two lists of strategies, one for 'before listening' and the other for 'after listening', to which they responded whether they used the strategies in question. The results are shown in Table 4.14:

Table 4.14 Listening strategy statements found in the questionnaire

Performance checklist for listening		
Before listening	Listening Strategies	Frequency of Usage (%)
	Metacognitive Strategies	
1. I understand the task (what I have to do after I have finished listening)	Advance organization	80
2. I have attempted to recall all that I know about the topic	Advance organization	60
3. I have attempted to recall what I know about the type of text I will listening to and the type of information I will probably hear	Advance organization	50
4. I have made predictions on what I am about to hear	Advance organization	60
5. I know what I must pay attention to while I listen	Directed attention	70
6. I am ready to pay attention and concentrate on what I am about to hear	Directed attention	90
	Socioaffective Strategies	
7. I have asked the teacher for clarifications, if necessary	Questioning for clarification	40
8. I have encouraged myself	Self-encouragement	60
After listening		
	Metacognitive Strategies	
1. I focused my attention on the information needed to accomplish the task	Selective attention	70
2. I used key words, cognates, and word families to understand the text	Selective attention	60
3. I concentrated on the task to be accomplished	Self-management	70
4. I attempted to verify my predictions	Comprehension monitoring	50
5. I revised my predictions accordingly	Comprehension monitoring	40
6. I evaluated the logic/plausibility of what I understood	Performance evaluation	100
	Cognitive Strategies	
7. I used my knowledge of the context and of text structure to understand the text	Linguistic inferencing	60
8. I used background noises, tone of voice, and other clues to help me guess at the meaning of words I did not understand	Extralinguistic inferencing	30

Note. n = 24.

Table 4.14 demonstrates that some strategies are used by a high proportion of the subjects, namely 'I evaluated the logic/plausibility of what I understood' (100%), 'I am ready to pay attention and concentrate on what I am about to hear' (90%), 'I understand the task (what I have to do after I have finished listening)' (80%), 'I know what I must pay attention to while I listen' (70%), 'I focused my attention on the information needed to accomplish the task' (70%) and 'I concentrated on the task to be accomplished' (70%). It is interesting to note that all these are metacognitive strategies. Conversely, a cognitive strategy, 'I used background noises, tone of voice, and other clues to help me guess at the meaning of words I did not understand' (30%) were used by the least number of subjects.

The frequency of the different strategy types can be observed as follows:

Table 4.15 Frequency of listening strategies in percentage

Listening Strategies	Strategy examples	Sub-strategy Frequency of Usage (%)	Strategy Frequency of Usage (%)
Before Listening			
Metacognitive Strategies			
Advance organization	4	63	
Directed attention	2	80	71
Socioaffective Strategies			
Questioning for clarification	1	40	
Self-encouragement	1	50	45
After Listening			
Metacognitive Strategies			
Selective attention	2	65	
Self-management	1	70	
Comprehension monitoring	2	45	
Performance evaluation	1	100	70
Cognitive Strategies			
Linguistic inferencing	1	60	
Extralinguistic inferencing	1	30	45

Note. n = 24.

Table 4.15 shows that in the questionnaire, metacognitive strategies had the most examples (12), followed by cognitive and socioaffective strategies with two examples each.

In terms of mean frequency of usage with each of the sub-strategies, again, metacognitive strategies showed the highest proportion of usage. Thus, it is not surprising that as a whole, metacognitive strategies were used by 70% of the subjects. With cognitive strategies, linguistic inferencing actually had quite a following (60%). However, both cognitive and socioaffective strategies appeared to have been used by a relatively smaller proportion of subjects.

This listening strategy information obtained from the questionnaire appears to be in contrast with the information reported in the retrospective interviews where of all the strategies reported, cognitive strategies took up 55% while metacognitive strategies were mentioned 45% of the time. There was no mention of socioaffective strategies. Also, the most frequently mentioned sub-strategy was extralinguistic inferencing, again, in contrast with the questionnaire where extralinguistic inferencing was only mentioned by 30% of the subjects. A possible explanation for this is that subjects had no exposure to listening strategies and so had no understanding of what they meant and was therefore unable to identify them in practice or on paper in the questionnaire.

CHAPTER 5. CONCLUSION

Summary of Results

The results show that a CALL listening comprehension activity using an online video of an academic lecture can indeed facilitate incidental vocabulary acquisition as evidenced by the increase in subjects' mean scores on the partial dictation posttest and delayed posttest. Also, the visual aspect of the CALL activity, in the forms of the 'talking head', multiple-choice questions, overhead transparency notes and picture slides, increases subjects' chances of incidental vocabulary acquisition and listening comprehension.

With respect to the listening strategies employed to complete the CALL activity, the results obtained from the nine retrospective interviews support research findings, namely:

1. Cognitive strategies were reported by subjects more often than metacognitive strategies (although there was no mention of socioaffective strategies in the present study).
2. The most often used cognitive strategies were summarization, elaboration, and inferencing strategies.
3. Students with high proficiency in listening comprehension (LC) seem to use monitoring and inferencing strategies most frequently.
4. Low LC proficiency students seem to prefer cognitive strategies.
5. The high performing group uses both metacognitive and cognitive strategies while the low performing group uses cognitive strategies.

An interesting finding discovered in the present study is the propensity for beginner listeners to use the wrong media to answer listening comprehension questions.

The listening strategy findings obtained from the questionnaire, on the other hand, contradicted previous research (*Chapter 2*, pages 24-25), in that metacognitive strategies

showed the highest proportion of usage and extralinguistic inferencing had lower than expected frequency of usage.

Problems and Consequences

During the implementation of the study, several problems faced by the subjects were raised, the information of which (with their responses) was provided in the nine retrospective interviews. From an analysis of the problems, it might be possible to come up with some solutions. The problems in question can be divided into difficulties of a technical and non-technical nature.

Technical Difficulties

Audio problems consisted of the inability to rewind, play, stop, and pause the audio. Alternatively, the audio system sometimes froze or broke up. In other instances, the volume of the loudspeaker for the retrospective interviewees was unsatisfactory. For the rest of the subjects who used headphones, it was discovered that even then, they could hear external noise which could prove distracting.

The subjects' experienced adverse emotional reactions to these problems. Other reactions included pausing and restarting the audio, changing the position of the loudspeaker, adjusting the volume (although there were subjects who did not want to turn the volume up so as not to disturb others), putting on headphones, and skipping questions since subjects did not know which part of the lecture corresponded with which questions. In fact, these problems might have influenced whether the questions were answered correctly. However, there was one subject who used the time to read and memorize the questions before listening again. The significance of the problem is exemplified in the response of the student who

suffered the most audio problems during the CALL activity. He ranked the problem as a 4 or 5 on a scale from 1 to 10, with 1 being minimal and 10 being maximal. He also guessed that the audio problems took up 30% of the time although in actual fact, there were only six instances of audio problems amounting to only 2 minutes and 12 seconds (or 8% of the time) out of a total time spent on task of 26 minutes and 48 seconds.

The screen-capturing software, Camtasia Recorder which was used for the retrospective interviews, either alone or in conjunction with other software like Windows Media Player and Real Player, also caused some problems. During playback, words captured might not be clear, or there might be a mismatch between the audio and video (sound lagging behind visual), perhaps causing inaccuracy of interpretation. Other problems include bad audio recording quality and the window frame size constraint. Because the AVI files created by Camtasia Recorder are large, it was necessary to keep the frame size small. However, this required that subjects scroll up and down to read the listening comprehension questions when having a larger window would reduce scrolling and thus increase ease of task completion, which might have influenced performance on the CALL activity.

Non-technical Difficulties

These include having to use the loudspeaker instead of headphones in view of the loudspeaker problems, disinterest, lack of attention, motivation, and concentration, subjects' physical tiredness, some inability to understand the lecture, and fast speech rate.

Limitations of the Study

If the present study were to be replicated, certain weaknesses in the research design and implementation would have to be addressed first, such as ensuring that the reading

difficulty level of all the partial dictation tests was the same and training the raters for the strategies reported in the retrospective interviews. However, the biggest limitation of the present study was the discrepancy between the TOEFL, partial dictation vocabulary pretest and multiple-choice listening comprehension scores for the nine retrospective interviewees. Some manner of weighting the different test scores so that a representative sample of subjects divided according to listening proficiency levels would be necessary for the purpose of identifying listening strategies according to proficiency level. However, the fact that all the subjects had a TOEFL score of at least 500 suggests homogeneity in the subject population, so that using TOEFL scores might not be the best method of determining proficiency anyway.

Suggestions for Further Research

Recommendations which were outside the bounds of the present study but which would have improved the validity of the present research include ensuring that learners have enough time to complete the CALL activity and getting a bigger sample of students.

In terms of recommendations of a technical nature, it is possible to record audio generated by applications directly in Camtasia by using a Sound Blaster Live video card or placing a jumper wire between Line Out and Mic In on the sound card (TechSmith Corporation, 2002). Finally, a recommendation which, although not compulsory, might come in useful is transferring the partial dictation vocabulary tests into an online assessment format so that the CALL activity can truly be self-paced and autonomous. In this way, the time constraint mentioned earlier would have been resolved. However, certain programming

procedures like ensuring that learners listen to the partial dictation only a total of three times and that they cannot return to the previous screen would have to be considered.

This study looked at the utilization of listening strategies in a CALL activity. Research into the effects of teaching these strategies and adapting other listening strategies for use in online activities would also be beneficial.

Furthermore, the research on listening strategies in the present study is based on nine screen-capture recordings and retrospective interviews. To increase the validity of the findings, a larger sample would be advisable. However, to do that, certain hardware and software facilities would have to be in place, some of which have already been mentioned, but other facilities include the need for more CD Writers to record screen-capture recordings.

Finally, more research on media in the video format would be beneficial, namely the influence of the audio, video, written questions, overhead transparency notes, and picture slides on incidental vocabulary acquisition and listening comprehension. Also, a balance in terms of the number of questions for both the partial dictation and listening comprehension in the different media would be useful.

This study has produced findings which supported previous literature and raised some new issues. However, it must be noted that second language listening comprehension strategies research in the CALL medium is a relatively new area and much still awaits discovery.

APPENDIX A. LISTENING COMPREHENSION STRATEGIES AND THEIR DEFINITIONS WITH REPRESENTATIVE EXAMPLES

Metacognitive Strategies		
1. Planning: Developing an awareness of what needs to be done to accomplish a listening task, developing an appropriate action plan and/or appropriate contingency plans to overcome difficulties that may interfere with successful completion of the task.		
1a) Advance organization:	Clarifying the objectives of an anticipated listening task and/or proposing strategies for handling it.	I read over what we have to do. I try to think of questions the teacher is going to ask.
1b) Directed attention:	Deciding in advance to attend in general to the listening task and to ignore irrelevant distractors; maintaining attention while listening.	I listen really hard. I pick out the words that are familiar so that… (in combination with inferencing)
1c) Selective attention:	Deciding to attend to specific aspects of language input or situational details that assist in understanding and/or task completion.	I listen for the key words. I establish the speakers in the conversation, their relationship by tone of voice, how they will address each other. This will limit the topics of discussion (in combination with planning, voice inferencing, and elaboration).
1d) Self-management:	Understanding the conditions that help one successfully accomplish listening tasks and arranging for the presence of those conditions.	I try to get in the frame of mind to understand French. I put everything aside and concentrate on what she is saying.
2. Monitoring: Checking, verifying, or correcting one's comprehension or performance in the course of a listening task.		
2a) Comprehension monitoring:	Checking, verifying, or correcting one's understanding at the local level.	I translate and see if it sounds right (in combination with translation). I just try to put everything together, understanding one thing leads to understanding another.
2b) Auditory monitoring:	Using one's "ear" for the language (how something sounds) to make decisions.	I use my knowledge of Portuguese, primarily sound (in combination with transfer). I use the sound of words to relate to other words I know.
2c) Double-check monitoring:	Checking, verifying, or correcting one's understanding across the task or during the second time through the oral text.	I might catch it at the end and then I'd go back. Sunny in the morning, that's not making sense… (earlier) it sounded like a cold front, something doesn't make sense to me any more.
3. Evaluation: Checking the outcomes of one's listening comprehension against an internal measure of completeness and accuracy.		
3a) Performance evaluation:	Judging one's overall execution of the task.	How close was I? (at end of a think-aloud report).
3b) Strategy evaluation:	Judging one's strategy use.	I don't concentrate too much to the point of translation of individual words because then you just have a whole lot of words and not how they're strung together into some kind of meaning.

4. Problem identification:	Explicitly identifying the central point needing resolution in a task or identifying an aspect of the task that hinders its successful completion.	I'm not sure but "partager" and I'm not really sure what that means. I think that kind of has something to do with that. Music, there is something, ... "des jeux", I don't know what that is.
Cognitive Strategies		
1. Inferencing: Using information within the text or conversational context to guess the meanings of unfamiliar language items associated with a listening task, to predict outcomes, or to fill in missing information.		
1a) Linguistic inferencing:	Using known words in an utterance to guess the meaning of unknown words.	I use other words in the sentence. I try to think of it in context and guess.
1b) Voice and paralinguistic inferencing:	Using tone of voice and/or paralinguistics to guess the meaning of unknown words in an utterance.	I listen to the way the words are said. I guess, using tone of voice as a clue.
1c) Kinesic inferencing:	Using facial expressions, body language, and hand movements to guess the meaning of unknown words used by a speaker.	I try to read her body language. I read her face. I use the teacher's hand gestures.
1d) Extralinguistic inferencing:	Using background sounds and relationships between speakers in an oral text, material in the response sheet, or concrete situational referents to guess the meaning of unknown words.	I guess on the basis of the kind of information the question asks for. I comprehend what the teacher chooses to write on the board to clarify what she is saying.
1e) Between parts inferencing:	Using information beyond the local sentential level to guess at meaning.	Because in the beginning she said "course," so maybe it was, maybe it was a race... may be a horse race... You pick out things you do know and in the whole situation piece it together so that you do know what it does mean.
2. Elaboration: Using prior knowledge from outside the text or conversational context and relating it to knowledge gained from the text or conversation in order to predict outcomes or fill in missing information.		
2a) Personal elaboration:	Referring to prior experience personally.	I think there is some big picnic or a family gathering, sounds like fun, I don't know ... You know... maybe they missed each other, because that happens to me lots we just miss accidentally and then you call up and say, "Well, what happened?"
2b) World elaboration:	Using knowledge gained from experience in the world.	Recognizing the names in sports helps you to know what sport they are talking about. I use the topic to determine the words that I will listen for (in combination with selective attention).
2c) Academic elaboration:	Using knowledge gained in academic situations.	[I know that] from doing telephone conversations in class. I relate the word to a topic we've studied. I try to think of all my background in French.
2d) Questioning elaboration:	Using a combination of questions and world knowledge to brainstorm logical possibilities.	Something about sixty-one, restaurant, sixty-one. Maybe it's the address. Um, he said he started, probably fixing up his apartment, something about his apartment. Probably just moved in, um, because they're fixing it up.

2e) Creative elaboration:	Making up a story line, or adopting a clever perspective.	Sounded like introducing something, like it says here is something but I can't figure out what it is, it could be like... one of the athletes, like introducing some person or something. I guess there is a trip to the Carnival in Quebec so maybe it is like something for them to enter a date, to write, or draw...
2f) Imagery:	Using mental or actual pictures or visuals to present information; coded as a separate category but viewed as a form of elaboration.	I can picture the words in my mind. I make pictures in my mind for words I know, then I fill in the picture that's missing in the sequence of pictures in my mind.
3. Summarization:	Making a mental or written summary of language and information presented in a listening task.	I remember the key points and run them through my head, "what happened here and what happened here" and get everything organized in order to answer the questions.
4. Translation:	Rendering ideas from one language to another in a relatively verbatim manner.	I translate. I'll say what she says in my head, but in English. A little voice inside me is translating.
5. Transfer:	Using knowledge of one language (e.g., cognates) to facilitate listening in another.	I try to relate the words to English. I use my knowledge of other languages: English to understand German and Portuguese (primarily sound) to understand French.
6. Repetition:	Repeating a chunk of language (a word or phrase) in the course of performing a listening task.	I sound out the words. I say the words to myself.
7. Resourcing:	Using available reference sources of information about the target language, including dictionaries, textbooks, and prior work.	I look it up in a dictionary. I look in the back of the book.
8. Grouping:	Recalling information based on grouping according to common attributes.	I try to relate the words that sound the same (in combination with auditory monitoring). I break up words for parts I might recognize.
9. Note-taking:	Writing down key words and concepts in abbreviated verbal, graphic, or numerical form to assist performance of a listening task.	I write down the word. When I write it down, it comes to my mind what it means.
10. Deduction/ induction:	Consciously applying learned or self-developed rules to understand the target language.	I use knowledge of the kinds of words such as parts of speech.
11. Substitution:	Selecting alternative approaches, revised plans, or different words or phrases to accomplish a listening task.	I substitute words, translate and see if it sounds right (in combination with translation and comprehension monitoring).

Socioaffective Strategies		
1. Questioning for clarification:	Asking for explanation, verification, rephrasing, or examples about the language and/or task; posing questions to the self.	I'll ask the teacher. I'll ask for a repeat.
2. Cooperation:	Working together with someone other than an interlocutor to solve a problem, pool information, check a learning task, model a language activity, or get feedback on oral or written performance.	I ask someone who knows the word. I ask a friend. I ask the person next to me.
3. Lowering anxiety:	Reducing anxiety through the use of mental techniques that make one feel more competent to perform a listening task.	I think of something funny to calm me down. I take deep breaths.
4. Self-encouragement:	Providing personal motivation through positive self-talk and/or arranging rewards for oneself during a listening activity or upon its completion.	I try to get what I can. O.K.... my hunch was right. I tell myself that everyone else is probably having some kind of problem as well.
5. Taking emotional temperature:	Becoming aware of, and getting in touch with one's emotions while listening, in order to avert negative ones and make the most of positive ones.	I take it home and take it out on my family. O.K. I'm getting mad 'cause I don't understand.

(Vandergrift 1997:392-395)

APPENDIX B. DETAILED SUMMARY OF VANDERGRIFT'S (1996; 1997) RESEARCH FINDINGS

Summary of Vandergrift's (1996) Research Findings

Strategy type	Course level	Gender
• Within metacognitive strategies, participants are most familiar with planning strategies. • Cognitive strategies are most prominent. • Decrease in percentage of distinct cognitive strategies is counterbalanced by increase in percentage of distinct metacognitive strategies. • Increase in reporting of metacognitive strategies overtakes increase in reporting of socio-affective strategies.	• Increase in distinct strategies by course level. • Increase in distinct metacognitive, cognitive, and socio-affective strategies by course level.	• Females reported using more distinct strategies. • Females reported using greater variety of metacognitive, cognitive strategies.

Summary of Vandergrift's (1997) Research Findings

Strategy use	Level of language proficiency and Listening ability	Gender
• Reported most: cognitive, then metacognitive strategies. • Most reported cognitive strategies in descending order: summarization, elaboration, inferencing, translation, transfer, repetition.	• Certain cognitive strategies (transfer and translation) decrease by proficiency level. • Metacognitive strategies reported twice as much by Intermediate than Novice listeners. • Intermediate listeners reported more deep-processing, metacognitive strategies while novice listeners reported more surface-processing strategies. • Intermediate listeners use metacognitive strategies while Novice listeners use cognitive strategies • The biggest difference between successful and less successful listeners appears to be the use of metacognitive strategies (O'Malley & Chamot, 1990; Vandergrift, 1997b)	• Very few differences when reported strategy use for all male and female participants is compared. • Females reported slightly more metacognitive strategies, almost exclusively self-evaluation strategies.

APPENDIX C. SUBJECTS' PERSONAL CHARACTERISTICS

Age	#	%	Gender	#	%	Nationality	#	%	Native Language	#	%	TOEFL	#	%	Level of Education	#	%
18-22	8	33	Male	19	79	China	11	44	Chinese	12	52	<173 / <500	0	0	Freshman	7	29
23-27	11	46	Female	5	21	Indonesia	3	13	Indonesian	3	13	173-197 / 501-530	10	42	Sophomore	2	8
28-32	4	17				Korea	3	13	Korean	3	13	198-220 / 531-560	4	17	Junior	2	8
33-37	0	0				Colombia	2	9	Japanese	2	9	221-249 / 561-599	7	29	Senior	1	5
38-42	0	0				Japan	2	9	Spanish	2	9	>250 / >600	3	12	Masters	5	21
>42	1	4				Marshall Islands	1	4	Thai	1	4				PhD	7	29
						Taiwan	1	4									
						Thailand	1	4									
	24	100		24	100		24	100		24	100		24	100		24	100

APPENDIX D. QUESTIONNAIRE

Directions: Please fill in the information requested below. Your answers will be kept confidential and only the researcher will have access to the information you provide.

Name			
Age	18-22 ☐	28-32 ☐	38-42 ☐
	23-27 ☐	33-37 ☐	above 42 ☐
Nationality			
Native language			
Other languages			

Most recent TOEFL score	(Year	Month	)
TOEFL scores for	Listening Comprehension		_____
	Structure and Written Expression		_____
	Reading Comprehension		_____
Level of education	Freshman ☐	Junior ☐	Masters ☐
	Sophomore ☐	Senior ☐	Ph.D. ☐

1. How do you feel about listening to English? (please circle)

good at it	1	2	3	4	5	bad at it
love it	1	2	3	4	5	hate it

2. Do you study English alone? [check (√) one]
   a lot ☐ often ☐ sometimes ☐ occasionally ☐ never ☐
3. Do you practice listening alone? [check (√) one]
   a lot ☐ often ☐ sometimes ☐ occasionally ☐ never ☐
4. Approximately how many hours do you work with computers per day? _____
5. How do you feel about using the computer and Internet? (please circle)

good at it	1	2	3	4	5	bad at it
love it	1	2	3	4	5	hate it

6. Your listening assignment consists of an Academic Lecture. Using the legend below, please rate them (circle your choice):

Strongly agree 1 Agree 2 Neutral 3 Disagree 4 Strongly disagree 5

	The Listening Texts					The Assignments				
are easy	1	2	3	4	5	1	2	3	4	5
are relevant to my needs	1	2	3	4	5	1	2	3	4	5
are enjoyable	1	2	3	4	5	1	2	3	4	5
give me complete control over my learning	1	2	3	4	5	1	2	3	4	5
allow me to work at my own speed	1	2	3	4	5	1	2	3	4	5
require too much time	1	2	3	4	5	1	2	3	4	5
will improve my English	1	2	3	4	5	1	2	3	4	5
will improve my listening skills	1	2	3	4	5	1	2	3	4	5

Performance checklist for listening

Before listening	Yes	After listening	Yes
I understand the task (what I have to do after I have finished listening)		I concentrated on the task to be accomplished	
I know what I must pay attention to while I listen		I attempted to verify my predictions	
I have asked the teacher for clarifications, if necessary		I revised my predictions accordingly	
I have attempted to recall all that I know about the topic		I focused my attention on the information needed to accomplish the task	
I have attempted to recall what I know about the type of text I will listening to and the type of information I will probably hear		I used background noises, tone of voice, and other clues to help me guess at the meaning of words I did not understand	
I have made predictions on what I am about to hear		I used key words, cognates, and word families to understand the text	
I am ready to pay attention and concentrate on what I am about to hear		I used my knowledge of the context and of text structure to understand the text	
I have encouraged myself		I evaluated the logic/plausibility of what I understood	

(Place a check mark in the 'yes' column when verifying each statement)

In order to improve my performance, next time I will _____

7. Did you have problems with the computer? (Use back if you need more space) Yes ☐ No ☐
   If yes, please explain: _____
8. Do you have any comments, suggestions, and feedback about the listening passage and assignment? (Please use the back if you need more space.) _____

[Questionnaire adapted from Brett, P. (1996), Hegelheimer, V.H. (1998), and Vandergrift, L. (1999)]

APPENDIX E. REQUEST FOR TESL PROFESSORS' HELP TO IDENTIFY DIFFICULT VOCABULARY IN TRANSCRIPT OF ACADEMIC LECTURE

Dear professors,

I am planning to conduct some research with English 101L students. However, in order to get the experiment ready, I need your help. All it involves is to read the passage below and to underline (or highlight) words you think are difficult. Another way of getting at the most difficult words would be to consult a word frequency list, but I believe that expert teachers (you) can get at that better. I believe that the entire 'procedure' should only take about 10 minutes, and I would be ever so grateful to get your input.

Directions:

Please underline or highlight 30 words in the passage below that you think are the most difficult ones. Even though you may find the passage not terribly difficult to begin with, please underline 30 words.

Your name: _____
# of years you have taught ESL: _____

Please return all three pages to **Esther Kon**'s mailbox.

In case you have any questions, please leave a message in my mailbox, or email me at estherkon@yahoo.com

Thank you very much in advance,

Esther Kon

Good afternoon. What I'd like to do today is to define horticulture and as a goal throughout the next information, you should be able to understand exactly where the term comes from and what it actually entails as far as the discipline. So with that, I'd like to start with the first overhead, looking at the concept of agriculture. And agriculture is the production of food, fiber, and shelter that provides benefits to humans and the world. And I think we can understand this in a very broad sense that that is what we would associate with the agricultural sciences. In addition to that, the plant sciences within agriculture, these include three areas. The first is agronomy, which would be the disciplines that are associated with the science of growing and producing grain crops. Forestry is the discipline associated with forest management and forest products such as wood. And then the last one is horticulture, which we are going to learn about today and define.

Horticulture has been important within the United States and within our country, and has had professional significance throughout the entire life of our country. And I'd like to provide first a definition that includes what exactly horticulture provides to us as humans. So looking at the next overhead, you can see that horticulture is the science and art of producing nutritional plants that provide sustenance for the human body and many examples of these are listed here, such as fruits, vegetables, nuts, all of the different herbs that we use for culinary reasons as well as medicinal purposes, and then our beverages such as chocolate and coffee and tea. And the last aspect of the definition would include that it also provides beautiful plants for the human soul. So we have the human body and soul as part of horticulture and you can see these would include the flowering and ornamental plants, such as flowers, trees, shrubs, landscapes and lawns.

With that, I'd like to provide just a little bit of a background with regard to where the term horticulture came about. And the first writing that we have utilizing the term horticulture is from about 1600. And during the 1600s, we see the use of the term horticulture and this is originally from Latin and if you look at the overhead, you can see that the Latin term for horticulture is *hortus cultura* and *hortus* means garden and *cultura* is Latin for cultivation. So if we were to put these words together, this would be the culture of garden plants. And you can see at the bottom of the overhead as we move down that the culture of garden plants or the cultivation of crops that are associated with the garden is how we would define horticulture currently. When we think about exactly how this culture of garden crops comes about, knowing that the words came about from the 1600s, we need to think about what was happening in the countries where Latin was the written language which would be primarily Europe in those times. So as we look at what was going on within their lives at that time, it makes perfect sense why horticulture then as it's defined, would include all of the garden crops.

And if we would go to the first slide, what I'd like for you to see is the whole concept of having a village and you can see that surrounding the village, we have farm land where the grains of the agronomic crops would be raised. We have forests where the forestry products would be and then within the village or very close to the village where they would have protection would be where the garden crops would be raised. If we look at the next slide, you can see an example of again another village. This is in a northern European country and you

can see that the village is located very close to water source but then in the fields and the woods, the agronomic, the grazing of the animals and the forest products would be. In the next slide, you can see that here's an example within a garden where this happens to be a pear tree which is trailing along a house and so all of the crops that typically would have been grown within the village area or within the town would be a horticultural crop today. This would include then the flowers that you see in this slide in the window boxes as well as fruit crops, vegetable crops, medicinal plants and so on. In the last slide, you'll notice that this happens to be a monastery and within this monastery, this actually through the Dark Ages was how much of the horticultural aspects were preserved, both the crops and the practices. So here in this particular area of the monastery, you see a cemetery as well as gardens that are part of that convent and monastery.

If we think about then, ending with the slides, if we just think about exactly what would be an aspect that could define horticulture compared to the other plant sciences, there are several aspects that really separate horticulture from these particular areas such as forestry and agronomy. And I have an overhead that lists these specifically, and the first one is that the factors that separate horticulture from forestry and agronomy, first of all, horticultural crops require very intensive management, labor and input costs. Much of the work that is done within a horticultural crop requires hand labor. Certainly we have mechanization within horticulture, some of you may have had the opportunity to see a video or slides of mechanical harvesting of tomatoes, but in general, we associate the horticultural crops with having very high intensive management, labor and input. The second item on the list is that the individual plant in particular is more important compared to large fielder plant that has higher value. In your readings, you'll see the example of a person backing up over a strawberry field compared to a wheat field. And when someone backs a car over one hundred wheat plants, it's of very little value and very little significance, yet our Horticulture Department is regularly asked to come up with value of ten strawberry plants or one shade tree because these have very high value in the landscape as well as for production purposes. The next one is that we have a much higher return per unit area per unit time. And this relates specifically to the fact that again, the crops have such high value that if we think about a square foot of a glass house or a green house, just the value of what can be produced in that square foot compared to a square foot of a forest, it's very, very different. The next one is that the plants and plant products are highly perishable and many of the practices that we use are because of this. And if you think about the concept of a cut-flower, a cut-rose on Valentine's Day and compare that to the value of a corn plant, in your just general life, you would know that the value is much different. And so these horticultural crops have great value and as part of that, part of that value comes from the fact that this rose plant is very perishable and does not have a long life after it's been removed from the plant. The last one that I just wanted to provide for you is that plants are used for aesthetic purposes. While forests are very beautiful and agronomic fields are also part of our American culture and human culture, we do have the sole purpose of horticultural crops being produced and utilized only for aesthetic purposes. And this is different from the other plant sciences.

So just to summarize today, horticulture is the science and art of growing and producing plants for high nutritional purposes such as food crops and also for aesthetic purposes. There

are three main disciplines within agricultural sciences that are plant-related, these are agronomy, forestry and horticulture. Horticulture differs from these other areas by having very high cost and input, by having very high returns and high value per plant, by actually having a perishable product that we need to manipulate very carefully and finally, by being used for aesthetic purposes. So with that, I'd like to open it up for any questions.

Although the word horticulture was first used in the early 1600s, did horticulture exist before that?
Yes, that's an excellent question. Horticulture has been with us since the beginning of civilization, so 10000 years ago, horticultural crops were domesticated and grown for food purposes and hopefully, they also had some aesthetic value as well.

Would breakfast cereals like corn flakes or orange juice be considered part of horticulture?
The whole concept of horticultural crops and production are very important in students' lifestyles and the breakfast cereals such as corn flakes would not be a horticultural crop. That would be an agronomic crop because it is a grain crop. In comparison though, or in contrast, the orange juice is a horticultural crop. These would be tree fruits that would be grown within a garden normally, and so then they would be classified as a horticultural crop.

In the lecture, you mentioned that being part of the horticulture, it has to be like a, in a city, right, and also, like, in an intensive care management, then would you say golf courses' part of horticulture?
Yes, when some of you complete your additional readings, you'll learn all the different disciplines within horticulture and it's very broad. We often say it goes from apples to zukini, all the way through the alphabet, and turf grass management which would include golf courses would be part of horticulture. It's an aesthetic use of a plant, in a lawn care, in a sports turf such as football or soccer and also golf courses.

What are some of the opportunities for students who graduate with a B.S. in Horticulture?
Students have possibilities ranging from management of a golf course, for example, managing the garden center, managing a nursery, managing a green house, through ownership as well as also working within horticultural sales, horticultural therapy where they use the plants for therapeutic value and through all of the crops that we have within our interior areas such as in malls and doctors' offices, so when you walk around on campus and when you see these other aspects in your life, it would just be part of horticulture.

OK. Thank you.

APPENDIX F. PARTIAL DICTATION PRETEST

Partial Dictation Test 1

Name: _____

Directions: As the passage is read to you, fill in the missing words. The passage will be read three times at a normal speed. During the first reading, read the passage but do not write anything. Try to understand the general meaning of the passage. During the second reading, there will be a pause after each blank. Fill in the blanks with the word you hear. After the third reading, you will have a 3-minute pause for final corrections. Now listen:

I will always remember my first visit to a _____. The _____ that were a part of its _____ were so beautiful it _____. Even the _____ nearby was _____. A monk there told me that they shared _____ with a _____ a few miles away. He said that the _____ had _____ growing on them, the _____ of which was the hobby of the _____ who was something of a _____ expert. It seemed that before he decided to become a monk, he was studying _____ at the university.

The _____ also grew flowers, mostly for _____ reasons, for _____, but my monk _____ also mentioned that some of the flowers were grown for _____. Other _____ included the _____, which, according to the monk, was high in _____! The _____ also had land _____ for _____ by _____ animals.

With all the different activities supported by the _____, especially with the _____ flowers and the work this _____, it is difficult to imagine how all the work will get done during _____ season. But at least we know that in terms of _____, the _____ appears to be quite _____.

Key

I will always remember my first visit to a monastery. The shrubs, landscapes, and lawns that were a part of its *surroundings* were so beautiful it *took my breath away*. Even the cemetery nearby was *well kept*. A monk there told me that they shared *the land and its produce* with a convent a few miles away. He said that the lawns had turf grass growing on them, the cultivation of which was the hobby of the *chief monk* who was something of a horticulture expert. It seemed that before he decided to become a monk, he was studying agronomy at the university.

The monastery also grew flowers, mostly for ornamental reasons, for aesthetic purposes, but my monk *informant* also mentioned that some of the flowers were grown for culinary reasons. Other nutritional plants included the zucchini, which, according to the monk, was high in fiber! The monastery also had land *set aside* for grazing by domesticated animals.

With all the different activities supported by the monastery, especially with the highly perishable flowers and the work this entails, it is difficult to imagine how all the work will get done during harvesting season. But at least we know that in terms of sustenance, the monastery appears to be quite *self-sufficient*.

APPENDIX G. PARTIAL DICTATION POSTTEST

Partial Dictation Test 2

Name: _____

Directions: As the passage is read to you, fill in the missing words. The passage will be read three times at a normal speed. During the first reading, read the passage but do not write anything. Try to understand the general meaning of the passage. During the second reading, there will be a pause after each blank. Fill in the blanks with the word you hear. After the third reading, you will have a 3-minute pause for final corrections. Now listen:

When I first arrived at Iowa State University, one of the buildings that held _____ for me was the _____ Department's green house. Within the green house were beautiful but _____ flowers, flowers grown for _____ and _____. There were also _____ grown for _____, the _____, for example. I've been told that the _____ is high in _____ although I'm not sure how much I can trust the _____.

Besides the green house, other places of interest included the _____ that come under the _____ of the _____ and _____Departments. It seems that they grow _____ on the _____. They also grow grass for the _____ of _____ animals. I am uncertain if the _____ of all the different _____ is for the benefit of private _____ or for their _____. Certainly, when _____ season _____, the amount of work that this _____ would be _____, although I suppose they could request for the help of the _____ and _____ they provide supplies to. And speaking of convents, I've recently_____ of visiting one of them, and guess what? My favorite place there is the _____!

Key

When I first arrived at Iowa State University, one of the buildings that held *great fascination* for me was the Horticulture Department's green house. Within the green house were beautiful but highly perishable flowers, flowers grown for ornamental and aesthetic purposes. There were also nutritional plants grown for culinary reasons, the zucchini, for example. I've been told that the zucchini is high in fiber although I'm not sure how much I can trust the *accuracy of the source*.

Besides the green house, other places of interest included the shrubs, landscapes, and lawns that come under the *jurisdiction* of the Agronomy Department. It seems that they grow turf grass on the lawns. They also grow grass for the grazing of domesticated animals. I am uncertain if the cultivation of all the different *endeavors* is for the benefit of private sustenance or for their *economic value*. Certainly, when harvesting season *rolls around*, the amount of work that this entails would be *no laughing matter*, although I suppose they could request for the help of the monastery and convent they provide supplies to. And speaking of convents, I've recently *had the pleasure* of visiting one of them, and guess what? My favorite place there is the cemetery!

APPENDIX H. PARTIAL DICTATION DELAYED POSTTEST

Partial Dictation Test 3

Name: _____

Directions: As the passage is read to you, fill in the missing words. The passage will be read three times at a normal speed. During the first reading, read the passage but do not write anything. Try to understand the general meaning of the passage. During the second reading, there will be a pause after each blank. Fill in the blanks with the word you hear. After the third reading, you will have a 3-minute pause for final corrections. Now listen:

I was walking along the path leading from the _____ when I came upon the _____ bordering the _____ and _____. A closer look _____ the _____ that the _____ were not merely for _____ reasons or _____. No, there was the _____ of _____ for _____. There was _____ growing, which _____, was high in _____, according to the manager of the restaurant where I'd dropped by for a bite of lunch. The friendly manager later told me that the _____ in question had once been _____ by the _____ and _____ Departments of the university nearby. However, because they had not been _____, they had been taken over by a _____ that had poured millions into the area and placed _____ animals and _____ flowering products on the _____. So every now and then, you could see cattle _____ peacefully in one area, _____ being worked on in another area, and workers _____ the horticultural products in yet another area. Indeed, the labor this _____ proves that all these _____ were not conducted purely for _____ purposes. No, the corporation is in this to make a lot of money!

Key

I was walking along the path leading from the monastery when I came upon the shrubs, landscapes, and lawns bordering the convent and cemetery. A closer look *afforded* the *observation* that the lawns were not merely for ornamental reasons or aesthetic purposes. No, there was the cultivation of nutritional plants for culinary reasons. There was zucchini growing, which *incidentally*, was high in fiber, according to the manager of the restaurant where I'd dropped by for a bite of lunch. The friendly manager later told me that the lawns in question had once been *maintained* by the Horticulture and Agronomy Departments of the university nearby. However, because they had not been *economically viable*, they had been taken over by a *corporation* that had poured millions into the area and placed domesticated animals and highly perishable flowering products on the lawns. So every now and then, you could see cattle grazing peacefully in one area, turf grass being worked on in another area, and workers harvesting the horticultural products in yet another area. Indeed, the labor this entails proves that all these *endeavors* were not conducted purely for sustenance purposes. No, the corporation is in this to make a lot of money!

APPENDIX I. OVERHEAD TRANSPARENCY USED IN ACADEMIC LECTURE

Agriculture:

"Production of food, fiber, and shelter with benefit to humans and the world".

Plant Sciences within Agriculture:

- Agronomy
- Forestry
- Horticulture

Horticulture:
The science and art of producing

- nutritional plants for the human body, (fruits, vegetables, nuts herbs, & beverages) and
- beautiful plants for the human soul, (flowers, trees, shrubs, landscapes, & lawns).

Horticulture
hortus cultura

---

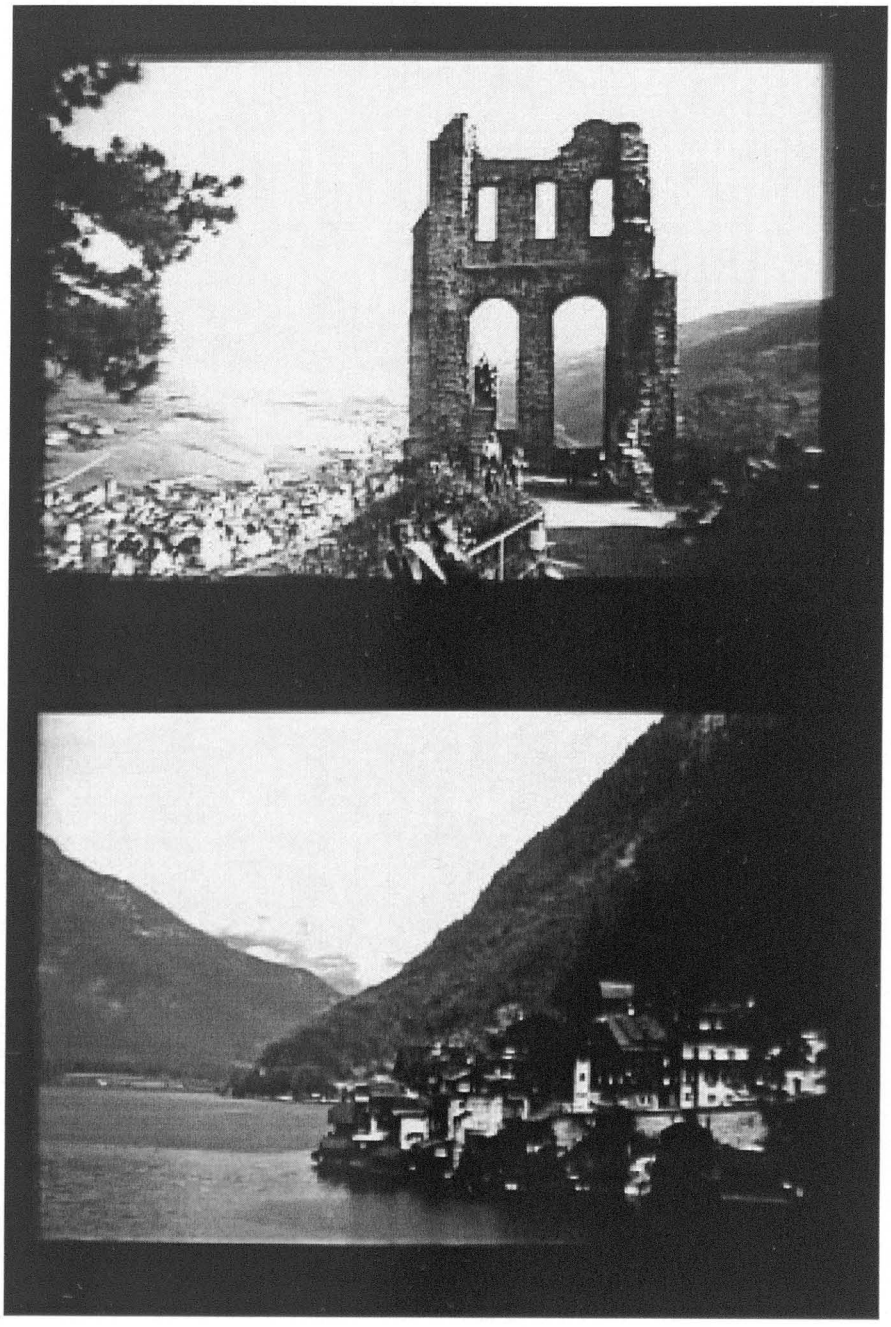
hortus	"garden"
cultura	"cultivation"

"Culture of garden plants"

Factors that separate horticulture from other agricultural plant sciences:

- more intensive management, labor & input costs,
- individual plant more important and has higher value,
- higher gross return per unit area per unit time,
- plants and plant products are highly perishable,
- plants are used for aesthetic purposes.

APPENDIX J. SLIDES SHOWN IN ACADEMIC LECTURE



APPENDIX K. LISTENING COMPREHENSION QUESTIONS

Name: _____

Directions: As you listen to the academic lecture, answer the questions below and then click "submit" to send your answers.
Note: The questions are arranged in chronological order, that is, the answer to Question 1 can be found before the answer to Question 2 in the academic lecture.

1. The lecture covers each of these **except**:
a the meaning of horticulture
b the idea of agriculture
c the definition of plant sciences
d the management of grain crops X

2. According to the lecture, the following are used for culinary reasons **except**
a grain X
b vegetables
c nuts
d herbs

3. The following are examples of horticultural products **except**:
a wood X
b trees
c drink products
d flowering plants

4. The word 'horticulture' was introduced in:
a the 1600s X
b the 16th century
c the beginning of civilization
d 10,000 years ago

5. Horticulture can be defined as:
a garden
b cultivation
c cultivation of garden crops X
d culture

6. In the first two slides, the concept being explained is that of having:
a villages X
b farms
c woods
d fields

7. Horticulture survived through the Dark Ages through planting in:
a gardens
b monasteries X
c convents
d cemeteries

8. It can be inferred that if you have very little space but a lot of manpower, you should concentrate on:
a horticulture X
b agriculture
c agronomy
d forestry

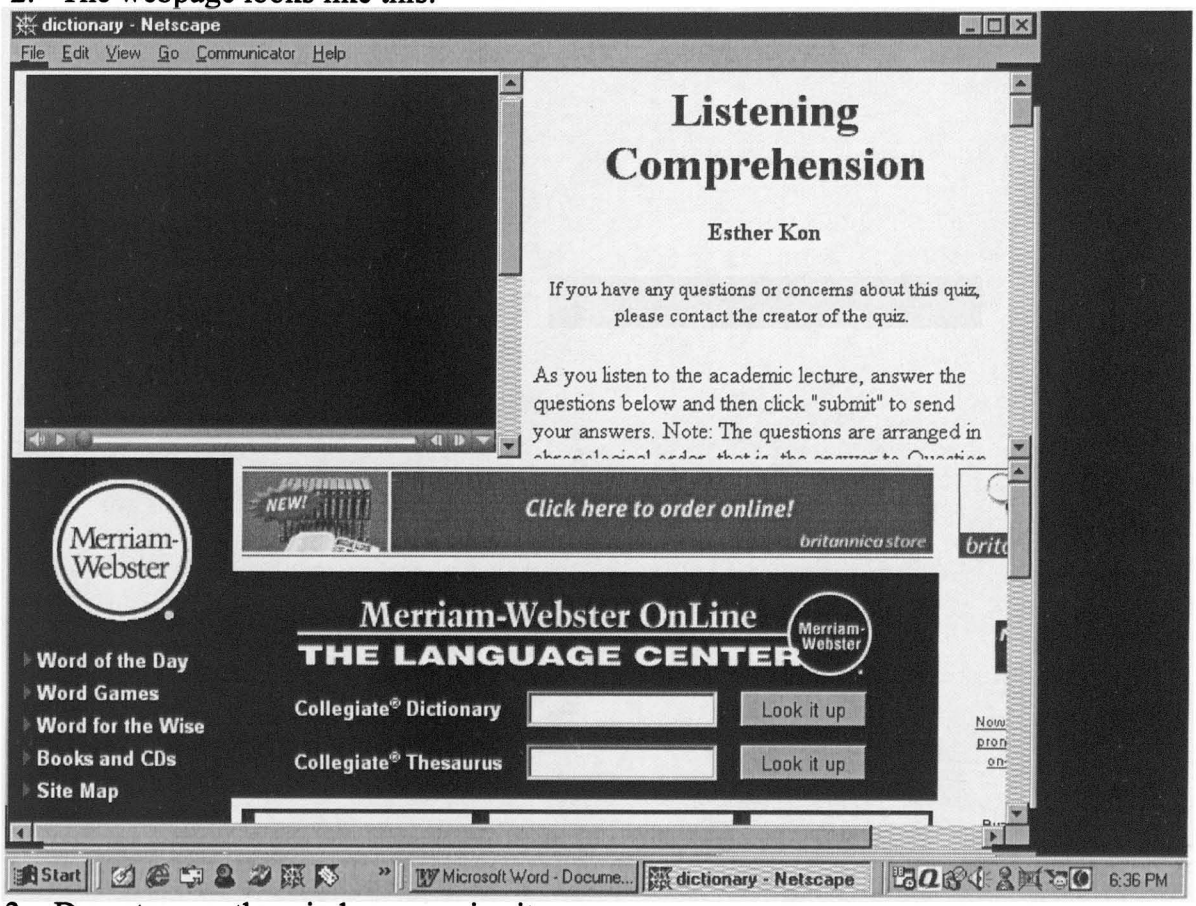
9. The following would be considered part of horticulture **except**:
a corn flakes X
b orange juice
c apples
d golf courses

10. Students who graduate with a B.S. in Horticulture can work in:
a nurseries X
b buildings
c malls
doctors' offices

APPENDIX L. INSTRUCTIONS FOR CALL ACTIVITY

Instructions:

1. This is the actual research experiment. You will be viewing an academic lecture and answering some multiple-choice questions.
2. The webpage looks like this:



3. Do not move the window or resize it.
4. Keep all activities within the fixed region.
5. Before you begin, press F9 to start Camtasia Recorder. You should see a bright green blinking corners of a square frame.
6. After you've completed the task, that is, answered all the comprehension questions and submitted the answers, press F10, raise your hands and ask for me.
7. After everyone has finished the experiment, you will have a posttest, much like the one you completed before the Thanksgiving break.

Thanks!

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